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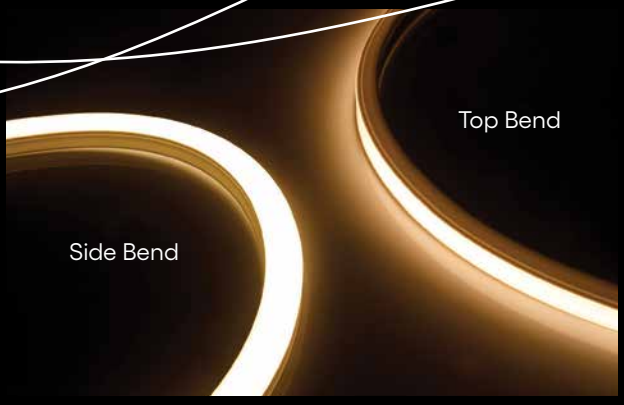


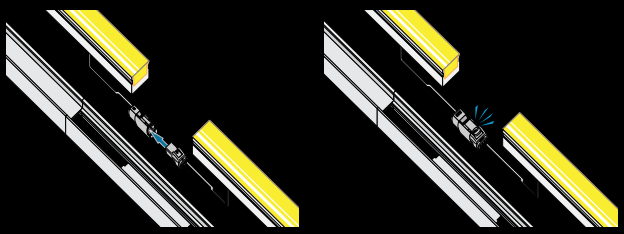

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## FIRST UP



## IN THIS ISSUE



## PLUS




Photo: Bold Interior Design, Inc.

# FEATURES



**On The Cover**
From a department store to a fire station, new approaches to "healthy lighting" showcase the market's continued growth (p. 36).

# EDITOR'S NOTE

## It's All Wellness Nowadays

Once upon a time, *LD+A* published an annual theme issue on "sustainable design." We sought out content on energy-efficient projects, asked some leading authorities to tackle the topic, dove into the latest buzzwords, and off we went. But as our longtime columnist Bill Warren was fond of saying, once efficacious luminaires squeezed all the excess watts out of lighting power density, the law of diminishing returns kicked in. There were only marginal energy savings to be found. All lighting became green lighting, so labeling an *LD+A* issue as such seemed redundant. What made all this happen? LEDs.

So, once upon a time, we published "LED application" theme issues. We sought out projects showing LEDs in action—charting the evolution from sneaker lights and movie steps to architectural applications. We asked our contributors to predict the growth curve and identify obstacles to adoption. But like "sustainable design," we eventually learned there was no need for an LED theme issue.

> The question was once, 'Are LEDs ready for prime time?' Now they're the light source in virtually every project

The question was once, "Are LEDs ready for prime time?" Then they became the light source in virtually every project. As Chevy Chase observed as the title character in *Fletch*, "It's all ball bearings nowadays."

That brings us to this month's *LD+A* theme, which presents a similar *Fletch*-like phenomenon: *It's all light and wellness nowadays*. The pages within include the usual suspects like color tuning and green design in familiar applications such as hospitals and schools, but light and health's tentacles have begun to reach into some unusual spaces. Would you believe a firehouse? A department store? It makes one wonder what the next wellness *LD+A* theme issue might include.

**Paul Tarricone**
Editor and Publisher
ptarricone@ies.org

LD+A
LIGHTING DESIGN and APPLICATION

**Editor and Publisher**
Paul Tarricone

**Managing Editor**
Samantha Schwirck

**Assistant Editor/**
**Digital Content Coordinator**
Michele Zimmerman

**Senior Art Director**
Samuel Fontanez

**Senior Art Director**
Charyliz Rodriguez

**Advertising Coordinator**
Leslie Prestia

Published by IES
120 Wall Street, 17th Floor
New York, NY 10005-4001
Phone: 212-248-5000
Website: www.ies.org
Email: ies@ies.org



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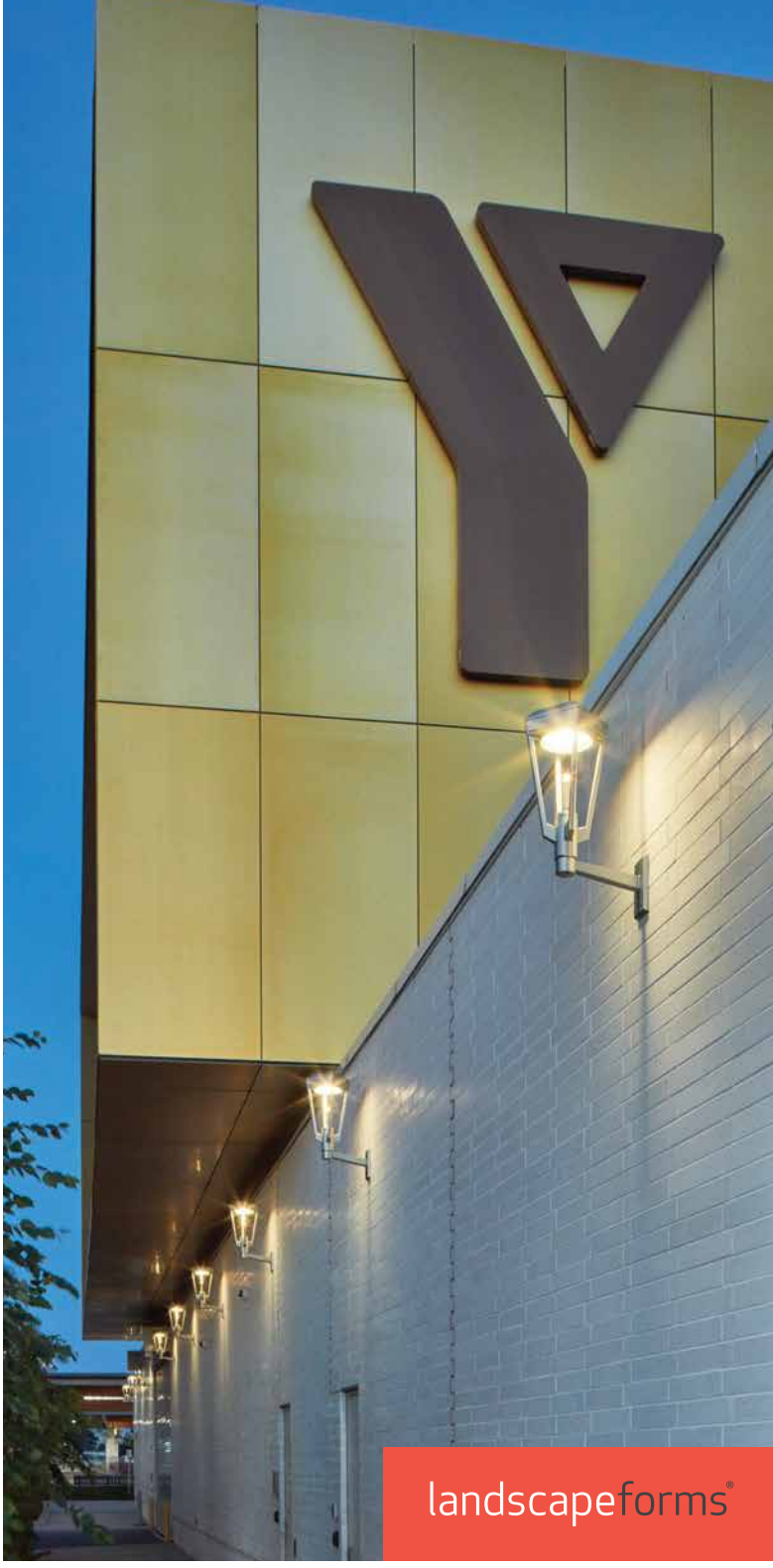

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# CONTRIBUTORS

**Kate Hickcox** is a lighting research scientist at Pacific Northwest National Laboratory, and one of the team members that designed the L-Prize. **p.16**

**Christien Methot** specializes in both architecture and entertainment. He founded Design One Lighting Design in 1996. **p.20**

**Lauri Tredinnick** is the studio leader for Pivotal, the lighting design studio within Affiliated Engineers. **p.24**

**Alexandra Gadawski**, WELL AP, AIA, LEED AP BD+C, is an architect and sustainability leader at HMFH Architects, an educational design firm based in Cambridge, MA.

**Jaime McGavin**, LEED AP BD+C, is an architectural designer at HMFH Architects. McGavin holds a B.S. in Architecture and a M. Arch. from Roger Williams University. **p.30**

**John D. Bullough**, Ph.D., Fellow IES, is program director of Population Health Science and Policy at the Light and Health Research Center, Icahn School of Medicine at Mount Sinai. **p.42**

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# PRESIDENT'S PERSPECTIVE

**Frank Agraz, LC**

The IES recently held the Annual Conference, an in-person venue that hosts lighting design project winners from around the world, visionary keynote speakers, experts on leading edge topics, and provides workshops that promote professional and personal growth. Although every conference session is worth attending, I have to say my favorite event is the Emerging Professionals (EP) Workshop.

Established over a decade ago, the EP Workshop provides an entire day of immersive educational content and opportunities for networking. Although many of our EPs are either students or early-career professionals, the program is truly designed for all age groups—even professionals making a career change later in life.

This year's workshop hosted more than 60 early-stage lighting practitioners. Generosity from our community made that possible: local IES Sections and corporate sponsors provide much of the funding to support the attendance of the workshop. Without their leadership and investment into our community, our program would have otherwise limited success. Thank you to all of those who see the value in training the future leaders of our Society.

**One of my privileges as President** is to speak to the group as they kick off their morning session. As I looked into the crowd, I was inspired by their presence and passion for learning. I'd like to use this space to share with you what I said to the EPs as they started their day, in hopes of reaching more EPs who couldn't be with us in person:

*Congratulations on taking your first steps toward learning more about our community. Whether this is your first day on the job or you're approaching your fifth year, each of us has a story about how we found the lighting community, or quite possibly, how it found you.*

*If you ask the veterans around here, most of them will say, "Once you get in the lighting business, you never leave." Why is that? I believe it is because our community is broad, challenging and allows you to make your own distinct path.*

*So, if we each make our own separate path, why are we all here in this room together? The answer is the IES. The Society is the conduit that promotes growth and brings people together for the benefit of all those who create, design and need lighting. At some point in time, we all realized that the IES has tremendous value and benefit. So much, in fact, we decided to join the IES as members. Reflecting back on my own path, I now clearly see my reason for joining the IES: access.*

> Our community is broad, challenging and allows you to make your own distinct path

*I gained access to my peers, the folks with whom I engage and learn from. I gained opportunities for new experiences and personal growth. I gained access to premier educational content, ANSI-accredited Recommended Practice documents, research papers and product workshops. I gained mentors and friends. In short, I gained access to the entire lighting community, which has fueled my career growth. Throughout the years, whatever the situation I found myself in with customers, vendors or colleagues, my involvement with the IES has often felt like a sort of armor that has protected me along the way.*

*I'm really excited for you as you shape your lighting path and I encourage you to really engage with our community. Talk to as many people as you can. Ask questions. Listen. Learn from your mistakes. Most of all, I hope your time with the IES helps you to discover that sweet spot in your lighting career between what you love, what you're good at and what pays well.*

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# INSIGHTS

Upcycled Fixtures • Modern Landscape • Market Moves

Made entirely from near-shore plastics such as fishing nets, the Seagrass fixtures even retain the material's original hue.

## Making Waves

*Ocean plastics find new life as 3D-printed pendants*

An estimated 8 million metric tons of plastic end up in our oceans each year, but at least one lighting manufacturer is working to lower that number. LightArt, a custom fabrication and design studio based in Seattle and Salt Lake City, recently introduced two upcycled pendants made entirely from ocean-bound and near-shore plastic. Each of the 3D-printed fixtures divert one pound of plastic from the ocean, transforming it into an aesthetically pleasing and sustainable lighting solution instead.

Created in collaboration with Oceanworks, the materials are sourced from mismanaged plastic waste within 31 miles of the coastline, as well as ocean debris collected close to land. The sphere-shaped Sea Foam pendant, for example, is made entirely from ocean-bound plastic such as single-use bags and water bottles. The teardrop-shaped Seagrass pendant, on the other hand, is sourced from near-shore plastic such as fishing nets, trawls and ropes. Both pendants are composed of polypropylene, a common plastic variety that creates a translucent finish and enables a luminous, incandescent glow.

Produced en masse, LightArt believes the pendants have the potential to make a significant impact on ocean cleanliness, and hopes other manufacturers will join the cause as well—pursuing more recycled products and raising sustainable industry standards along the way.

Plaza illumination supports a city-wide design philosophy in Coral Gables, FL.

Photo: Courtesy of Landscape Forms/Architectural Alliance Landscape

## Timeless...With a Twist

Coral Gables might not be "trendy"—but it sure is beautiful. Since the early 1900s, the Floridian city has faithfully followed the "City Beautiful Movement" it was founded upon. Promoting beautification and monumental grandeur via green space, ornate plazas and central fountains, the architectural and urban planning philosophy has been the guiding force behind almost all of Coral Gables' design choices—and the newly revitalized Columbus Center Plaza is no exception.

Located outside a residential high-rise, the public gathering space honors Coral Gables' cultural and architectural history via its manicured lawn, stone walkways, planters with palm trees, and large classic facet ball fountain. Landscape design firm Architectural Alliance Landscape relied on lighting to add a modern twist to the traditional motif. Area and path lights (Landscape Forms) provide general illumination, while matching backless benches with a clean, space-efficient design fit into the limited-circulation space. Additional complementary bike racks contrast the rectilinear geometry of the plaza and enhance the fountain's circular spray pattern, resulting in a timeless aesthetic that—as Coral Gables knows all too well—never goes out of style.



$124.7 BILLION

Estimated LED lighting market size by 2027

Source: Research and Markets

## MERGERS & MORE

- California-based consumer lamp maker **Feit** has acquired Australian smart-home company **LIFX**.
- Toronto-based **Liteline Corporation** has acquired **Contraste Lighting**.
- **Acclaim Lighting** has partnered with **Lumentender Control Solutions, Inc.** to offer an intuitive cloud-based solution for scheduling and control of supported API-based lighting control systems.
- **Fluence** has partnered with **BioLumic** to deliver BioLumic's proprietary UV light treatments to crops through Fluence's LED lighting solutions.

$1.4 BILLION

Projected stadium lighting market size by 2030

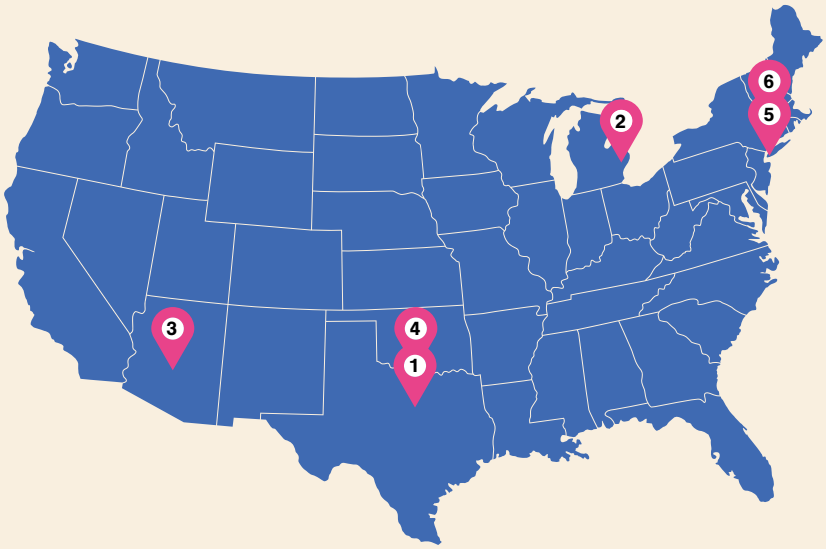
Source: Straits Research

## THEY SAID IT...

"The 2008 recession actually set us up for success during the pandemic; I had learned how to be more agile in how we do business."

**Christien Methot, "Pandemic Pivot," p. 20**

# EVENTS




**1. October 10-13:**
The 2022 IES Street & Area Lighting Conference will take place at the Hyatt Regency in Dallas. With a primary focus of improving outdoor lighting, the conference program will provide training classes, seminars, networking sessions and an exhibit hall.
www.ies.org

**2. October 16-20:**
The IES Aviation Lighting Committee (ALC) will conduct its annual Technology Meeting at the Detroit Marriott at the Renaissance Center. The event is the largest gathering of dedicated airport lighting professionals, offering opportunities for attendees to participate in technical papers, networking and an award banquet.
www.iesalc.org

**3. October 16-19:**
The interNational Association of Lighting Management Companies (NALMCO) will host its 69th Annual Convention and Trade Show at the Renaissance Phoenix Glendale Hotel & Spa in Phoenix. The educational event will offer participants opportunities for professional development, networking, recreation and one-on-one appointments with exhibitors.
www.nalmco.org

**4. January 10-13, 2023:**
Lightovation, the largest residential lighting trade event in North America, will take place at the Dallas Market Center. Held each winter and summer in Dallas, the event will welcome attendees from around the world to review new products from among more than 200 brands. Participants include retailers, buying groups, plumbing and electrical distributors, lighting designers, specifiers and interior designers.
www.dallasmarketcenter.com/lightovation

**5. March 7-8, 2023:**
LEDucation 2023 will take place at the Hilton New York Midtown. Organized by the Designers Lighting Forum of New York (DLFNY), the trade show and educational forum will offer a marketplace for solid-state lighting innovations, as well as a series of accredited conference sessions and seminars.
www.leducation.org

**6. May 21-25, 2023:**
LightFair 2023 will take place at the Jacob K. Javits Center in New York City. The event is the world's largest annual architectural and commercial lighting trade show and conference, with hundreds of exhibitors and industry-related educational courses, as well as networking opportunities and events.
www.lightfair.com

## EDUCATIONAL WEBINAR SERIES

Each month, the IES presents a live webinar on a current topic that helps expand your lighting knowledge and furthers our mission of improving life through quality of light. We invite you to register now at **www.ies.org/education.** Free to IES Members; non-members must pay **$20** (USD) to register.

**Continuing Education:**
Each webinar qualifies for (1) IES Continuing Education Unit (CEU). A certificate of completion will be emailed to all participants who complete the webinar. If you have any questions, please contact **education@ies.org.**

### NEXT WEBINAR

**LP-16: Documenting Control Intent Narratives and Sequence of Operations**
Thursday, October 20th | 12:00 PM ET

Join us for an overview of the concepts in ANSI/IES LP-16: Documenting Control Intent Narratives and Sequences of Operations. Intended for a variety of users in the lighting community, LP-16 is a reference manual of best practices on how design intent is included in the project documentation and communicated to the construction and commissioning teams. Learn directly from the Co-Chair of the committee about LP-16, ask questions during our live Q&A, and receive a 10% discount with registration to purchase the standard from our **store.ies.org.**

PRESENTERS:
**Lyn Gomes,** ***DPR Construction***
**Shoshanna A. Segal,**
***Luminous Flux***

# HOW THEY DID IT

***Studio Three Twenty One*** *minimized the number of visible fixtures to keep the focus on this 40-acre estate's extensive art collection and earn an* **IES Illumination Award of Merit.**

## Residential Estate, Napa Valley

**1.** A network of pathways connects 15 art installations, each illuminated by tree-mounted LED accent lights. Extended snoots and thick louvers control glare to satisfy the county's viewshed ordinance.

**2.** Tree-mounted fixtures also light the perimeter circulation of a courtyard outside the 20,000-sq ft Tuscan-style villa.

**3.** Burial uplights highlight a sculpture titled "Tree" by artist Ai Weiwei, which sits atop a reflecting pool in the courtyard.



Photos: Cesar Rubio, Keith Kosiba

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Kate Hickcox

## **Points for Justice** DEI and sustainability converge in DOE's L-Prize Competition

The DOE L-Prize is all about breaking new ground in lighting. The digital revolution continues to change lighting and controls technologies, but lighting has never been solely about the technology. It's about people—how we feel and function in the built environment and how our needs and preferences affect the natural environment. Can electric lighting be all things to all people? That's a tall order, but lighting professionals see lots of ways that it can be better, from technical performance to societal and environmental impacts. Here, the author (and L-Prize architect) addresses two areas where competitors can earn points above and beyond the competition's technical requirements: *product sustainability* and *diversity, equity, and inclusion (DEI)*.

**The term sustainability can** have different meanings depending on the context or community. In lighting, sustainability means considering the complex aesthetic, technical, visual and non-visual needs of people, while at the same time equitably benefiting the economy, society and the environment. The transition from legacy lighting technologies to LEDs—due to mandatory and voluntary standards, electric utility incentives, government procurement rules and private certification programs—brought a major reduction in operational energy use and associated carbon emissions.

However, because of this success, the lighting industry has been slow to adopt other sustainability approaches, such as materiality, circularity principles or embodied carbon reporting. With the L-Prize, the DOE is expanding the meaning of exceptional lighting performance to include material sustainability, diversity in organizations, transparency reporting, equity and inclusion, and product design principles for a circular economy.

Some of the factors driving the shift toward sustainability include procurement, internal company champions, pressure from clients and improved sustainability reporting options. This awareness is broadening the landscape of sustainability opportunities to include approaches such as reduction of materials used, circular design approaches, life-cycle assessments, and consideration of social impacts, energy equity and environmental justice. In any lighting project, product or team, sustainability goals and DEI goals need to be included holistically, from the early stages. These two topics are both linked to energy justice, which is the focus of DOE's Justice40 Initiative, designed to provide a pathway for equitable clean energy deployment to benefit communities that are overburdened, underserved, and have been disproportionately impacted by climate change and environmental injustice.

> The DOE is expanding the meaning of exceptional lighting

**Diversity, equity and** inclusion in the workplace matters. Awareness of DEI in the workplace—including taking actions that transform approaches, behaviors, programs and practices to create and sustain diverse, equitable and inclusive environments—is already built into the fabric of some organizations. For others, DEI might be less familiar or something that people are uncomfortable talking about. The L-Prize aims to support DEI in the lighting industry, and provides suggestions and guidance on this topic. If DEI is not already integrated into the competitor's organization, or not being addressed fully, our goal is to educate and support the integration and adoption of

these policies or approaches.

The L-Prize Rules DEI section asks for essay-style summaries and documentation describing the competitor's programs that promote the representation and participation of different groups of individuals, including people of different ages, races, ethnicities, abilities and disabilities, genders, religions, cultures and sexual orientations. The DEI category is optional; it has no minimum requirements and is scored subjectively by an Expert Review Panel (ERP). The ERP will score submissions based on how well the documentation addresses the high-level goals and specific requirements outlined in L-Prize Rules. Points can be awarded for DEI plans or protocols addressing three areas:

1. Implementing effective DEI plans and protocols
2. Uncovering new DEI gaps and opportunities
3. Outlining DEI in deployment and application

**Just as we advocate for** education and resulting action in aspects of DEI, the L-Prize implements an educational approach regarding improved sustainability and product life cycle. Like with DEI, circularity and product life cycle should be considered from the earliest design stages and throughout the design process. The L-Prize puts a specific emphasis on extended product lifetimes, circular design, and innovation in "material health" and "material transparency."

Material transparency refers to the disclosure of the ingredients and processes used to create materials or products, and their potential human health effects, environmental impacts, or social equity in manufacturing and recycling or disposal. Material health describes the quality or "health" of the materials used, and how these materials may affect humans and ecosystems. Material health includes knowledge about chemicals used in

products across their supply chains and chemicals of concern. As with the DEI sections, the product life-cycle sections in the L-Prize Rules list the requirements and provide multiple examples of actions or innovations that could earn points in these categories.

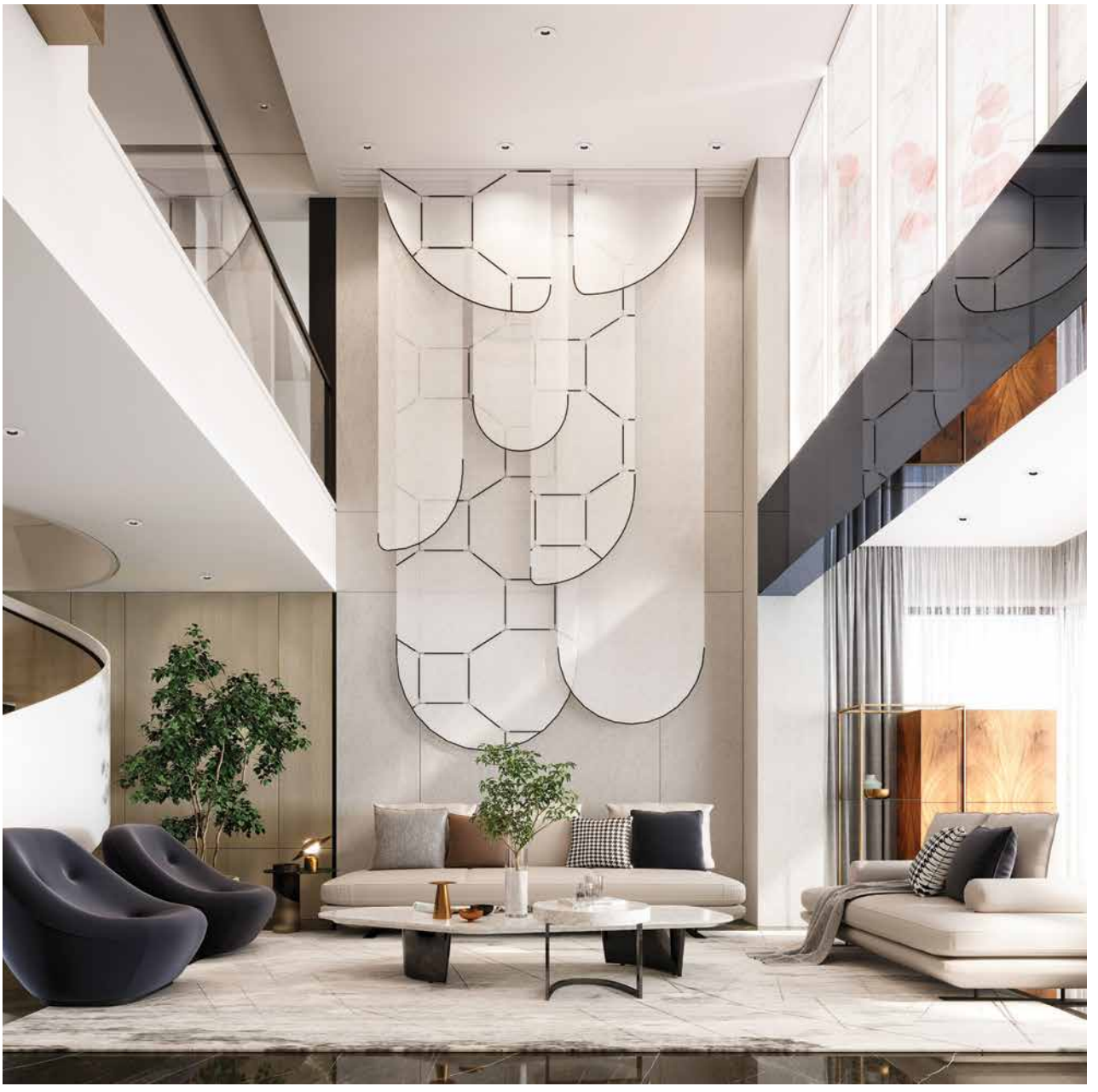
In the luminaire track of the L-Prize, for example, one of the product life-cycle requirements is "circular design," which minimizes raw resource inputs as well as waste, pollution and carbon emissions. Shifting from a linear life-cycle pathway to a circular one in the lighting industry involves changing structures, economy and practices. This change can start with manufacturers at the earliest design stages, perfect for the Prototype Phase. Circular design aims to eliminate waste and maximize the continual reuse, repair and remanufacturing of components. This L-Prize requirement seeks to reduce or maintain energy use over the lifetime of the luminaire, extend its useful lifetime, reduce the use and extraction of harmful materials, and decrease both operational and embodied carbon impacts using a modular design approach, reducing materials wherever possible. Competitors can earn points in this category using TM66, a technical memorandum and design tool developed by CIBSE and SLL to specifically address circular economy in the lighting industry.

The L-Prize Prototype Phase represents a golden opportunity to integrate sustainability into your approach early in the design process so you can maximize points throughout the competition and have a positive social and environmental impact at the same time. The ERP may also award points based on innovations that use recycled, bioderived, biodegradable or low-toxicity materials; innovations that reduce the use of harmful materials such as polyvinyl chloride (PVC); and innovations that restore, renew or revitalize their own sources of energy and materials. We are looking for your unique sustainability innovations, and many other prompts and suggestions can be found in the L-Prize Rules. We are hoping to enable entrants to create products and systems that will move the needle on sustainability.

**The Concept Phase of** the L-Prize concluded at the end of 2021, and Energy Secretary Jennifer Granholm announced four winners this past February. We encourage the Concept Phase winners to move on to the Prototype Phase, but anyone can enter any phase of the L-Prize. We are excited to see your unique or novel sustainability approaches and hope to feature some great examples of DEI in the lighting industry. Whether or not you plan to enter the L-Prize, we encourage you to read through the L-Prize Prototype Phase Rules document. There you can find new perspectives about these important (and related) topics in lighting—diversity, equity and inclusion, and sustainability. Without a strong focus on both, we on the L-Prize team believe that no matter the quality of the luminaires and systems, we will in some ways be remaining in the dark.

Kate Hickcox is a lighting research scientist at Pacific Northwest National Laboratory, and one of the team members that designed the L-Prize.

# No. 8 LIGHTING—TAKING YOU HIGHER



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# ESSAY

Christien Methot

## **Pandemic Pivot** A first-person account of how one designer turned to a new market

In February 2020, my horizons were vast and ready for expansion. We were contracted to design lighting for two 27-story high rises and had just completed an interactive experience for Verizon at Super Bowl LIV, which included an iconic glowing red dome along the Miami skyline. A year of massive growth was powering full speed ahead.

What would happen less than a month later is known to all of us now—as COVID-19 descended on America, project after project was postponed or canceled, some without deposits even being paid. I was saddened and horrified as my peers and friends in live entertainment lost all their work, the market drying up completely.

**Despite the spiraling** uncertainty around me, my determination to stay afloat did not waver. I knew my attitude toward facing these challenges was equally important as how I reacted to them, and I approached the unpredictability around me with three key tactics—learning from the past; creating new markets; and insisting on positivity.

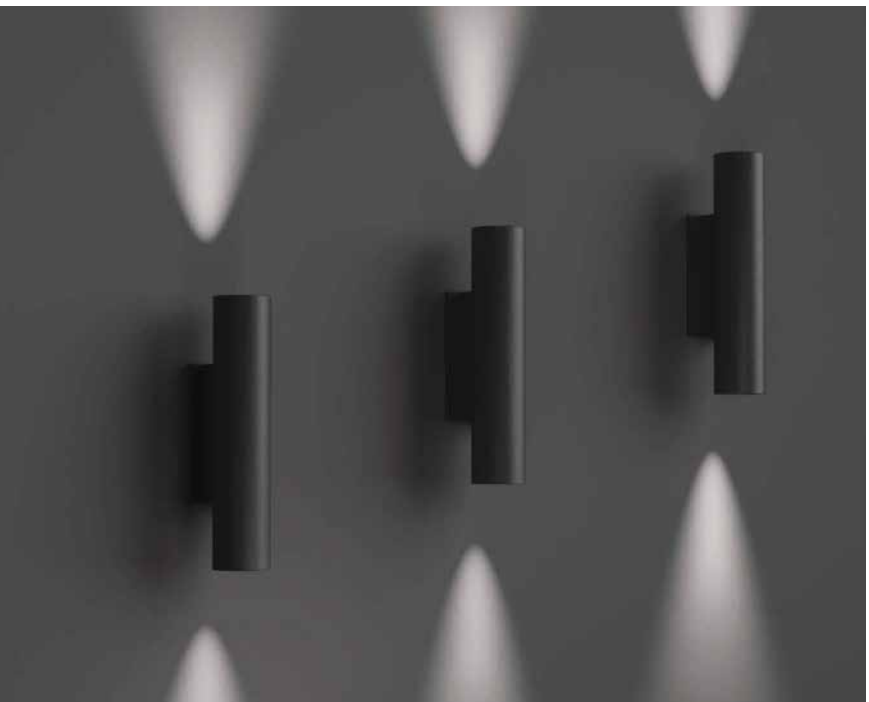
First, the 2008 recession actually set us up for success during the pandemic; I had learned how to be more agile in how we do business. The descent into the pandemic brought back flashes of the 2008 recession. Pre-2008, we had over a dozen employees on staff at Design One between New York and Los Angeles, and long-term commercial office leases proved difficult to manage as the recession took hold. This taught me that a bigger company is not necessarily a more resilient one, and how essential an adaptable staff and business plan is. When 2020 came around, I was more prepared. I knew how to pivot to what was most important—armed with a smaller three-person staff and short leases, I maintained low overhead costs, got rid of our permanent office space and made the switch to remote work nearly seamlessly.

Second, when everyone else was baking bread, I created a new lighting product to make people look their best for online meetings. With no live events, I knew I needed to think outside the box to find a new market. The answer came when my wife Karina Krepp, a holistic life coach, found herself in the dark on video calls with clients. Knowing the truth of the age-old lighting industry mantra, "If you can't see them, you can't hear them," my younger son and I devised a solution using linear warm LEDs with magnets that snapped onto mini tripods. The desktop lights were a hit with her clients, and her video sessions were so effective that I began selling them with the name CameraReady Lighting. Two years later, CameraReady has grown, now with battery and plug-in versions in different arrangements. I had never brought a product to life before and I found it very rewarding.

> The 2008 recession set us up for success

Third, I never allowed myself to be negative. I am very thankful to my team for being flexible and being problem solvers right along with me. Being thankful for what work was still there was crucial. Putting efforts toward projects the government deemed essential—for the most part in-progress architectural jobs—was my saving grace, and along with help from PPP loans, allowed me to stay above water for most of 2020.

During the first quarantine, my wife and I took ritual morning walks and brought food to the local refrigerator in our neighborhood. We would make sure to mention what we were thankful for. This went a long way in keeping my spirits high coming into work. It has always been my

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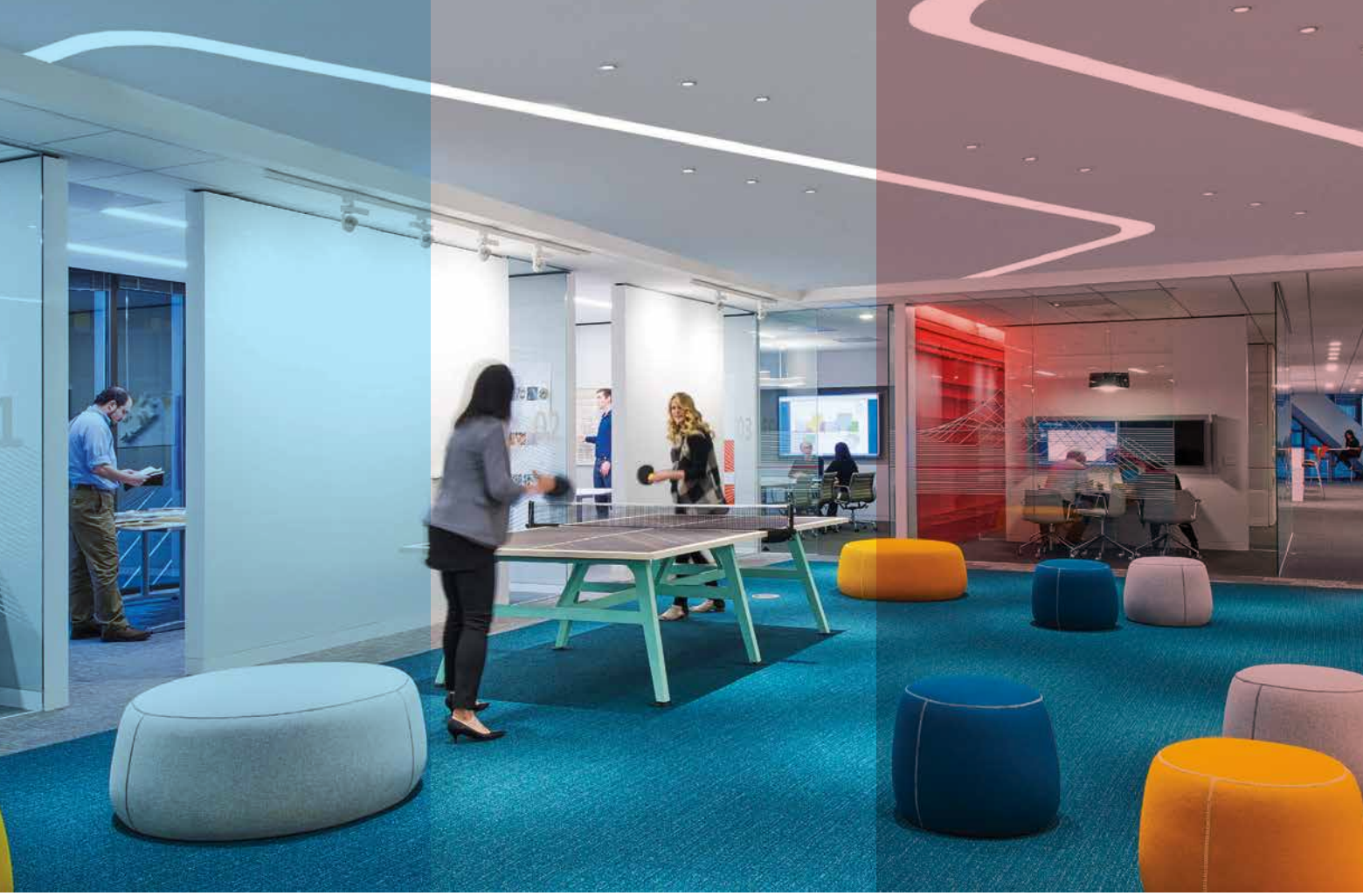
goal to have fun going to work and that stays true even though the pandemic may have challenged that.

Taking advantage of time with family, and wanting to keep my passion for light close to the heart, I took on a pet project with my older son to produce a documentary on being a lighting designer. It is coming to a film festival near you very soon. Never losing sight of the light at the end of the tunnel, I prioritized social media presence during the peak of COVID-19. Posting past projects and mentioning clients kept Design One at the front of their minds, and as business resumed in 2021, we saw a stream of old clients pop back up. Nurturing our enduring industry connections was vital to recovery.

**Now that the tides are calmer,** Design One Lighting Design is once again bringing beautiful and effective lighting to stages, buildings and anything in between. Leading a team to work well remotely, not committing to permanent offices, and making sure every hour can be billed to a client are at the core of my post-pandemic business restructure. But through all the ebbs and flows, my bottom line remains the same as it has always been: Allow yourself to be diversified in the work that you do. And remember whatever you choose to pay attention to can be what makes you successful in the moment. It's not always what you thought you went to school for.

Christien Methot specializes in both architecture and entertainment. Since 1996, his firm Design One Lighting Design has partnered with clients such as the U.S. Open, Oscar de la Renta and MdeAS Architects.



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# POST-OCCUPANCY CHECKUP

Patient rooms without windows at the University of Kentucky Children's Hospital put a premium on circadian support through lighting control. A look at how the lessons learned are being applied in similar projects **By Lauri Tredinnick**

At the University of Kentucky Children's Hospital, when expanding their Neonatal Intensive Care Unit, the owner chose to explore a plan using combined renovation and expansion space. Due to existing floor configurations, all patient rooms were designed without windows. In addition, a procedural change from dark, shared rooms to single rooms emulating a day/night cycle were planned. As a result, the lighting was a critical element in the success of the project.

Project design parameters included providing 600 lux at the isolette, indirect lighting with "no ledges" per UK design standards and a 0-10-V control system. Due to the infancy of tunable white LED systems at the time, a simple 7 a.m. to 7 p.m. schedule changing between 3000K and 5000K was planned. Color and intensity did not fade over the course of the day but was programmed to transition quickly at set intervals in the morning, evening and nighttime hours.

Despite the intended simplicity, as physical construction ended and the control sequence of operation was being finalized, the complexity with which the control system was required to operate and respond to users in the space became a reality. If the lights were turned off during a procedure, would the control system be able to turn them back on to the correct programmed intensity and color? What color and intensity would lights display in the middle of the night during nursing checks? The complexity of the control system design, exacerbated by the intricacies of the healthcare environment, limitations of LED driver dim-


A high level of indirect illumination throughout the day provides circadian support in the UK NICU windowless rooms.

ming range and required control protocol, were an element of "circadian design" not fully comprehended at the beginning of the project. Painstaking consideration for each touch of a button was required to ensure successful operation of the system.

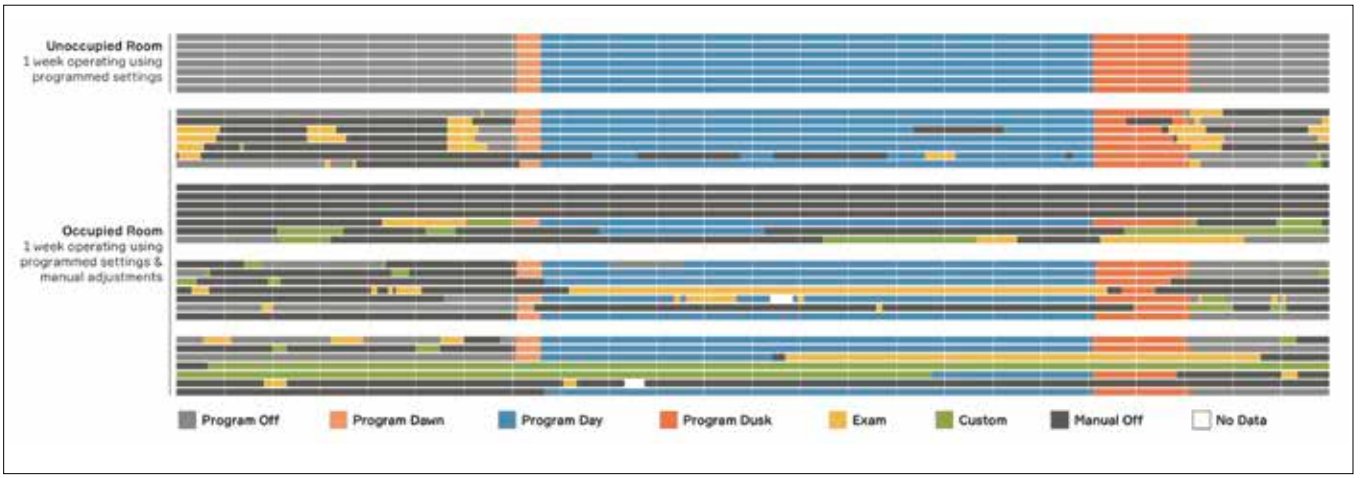
With construction complete and systems commissioned, it is typical for the design team to withdraw from the project, hoping the owner is satisfied and all systems will continue to run as intended. However, with this project, we began wondering how the system would really be used. Would the transition from the existing dark environment to a bright new one be so extreme that staff would turn the lights off each day? If turned off for a procedure, would staff remember to turn the lights back on correctly? When asking those questions, we learned that the control system could record and track each button setting through the course of the day. The hospital was willing to provide the data recorded to Pacific Northwest National Labs (PNNL) for their study and evaluation. (See technical paper "Lighting System Control Data to Improve Design and Operation: Tunable Lighting System Data from NICU Patient Rooms" in the May 2022 edition of *LEUKOS*). The alignment of these opportunities has provided valuable post-occupancy insight to our design team.

Using the data collected in five-minute intervals, from five patient rooms, over the course of 25 weeks, PNNL evaluated the basic system programming in comparison to daily use. The results were eye-opening. While the system was intended to provide a consistent scheduled pattern each day, the data enabled us to compare programmed settings vs. daily manual adjustments. It was evident that when the lighting was turned off during the day for special procedures, there were many instances when it was not turned back on to the programmed state. For nighttime hours, when light was required for patient checks, a preset was created to provide low illumination at the bed side. However, there were no instances where the preset was used as programmed. Instead, there was a 50/50 split between the exam and custom modes, with the nighttime preset light level being increased 100% of the time it was used. This information not only indicates that the preset level was too low, but also presents the concern that exam lighting turned on in the middle of the night would create sleep disruption, mitigating the effects of the cycled system overall.

Through reflection on the project design and post-occupancy evaluation, in combination with current product availability, the design team has been presented with several opportunities for refinement on future projects. Key attributes for future consideration of lighting products include LED drivers that have a full dimming range to provide smooth lighting transitions, non-proprietary LED board/control combinations, and the ability to graphically select color temperature from the control system to simplify programming. Significant technological advancements since project completion offer a variety of new products—but each must still contain these critical elements.

During review of the manual override issue, the design team discussed several items that could be enhanced. For instance:

- To minimize high-level nighttime overrides, the preset default ON level could be programmed slightly higher so that nursing staff does not need to increase the illumination.
- To reduce the number of times that FULL ON exam lighting is required, the raise/lower speed at which the




Standard patient room programming shown at the top of this graphic is a stark contrast to actual system use, shown through operational overrides during one week of use.

overrides respond to manual changes could be increased.

- To provide adequate nighttime illumination at the primary task locations with minimal spill into the remainder of the room, validation of primary task locations in combination with specifying luminaires using improved optics could more effectively reduce the need for a general high-level override during nighttime patient checks.

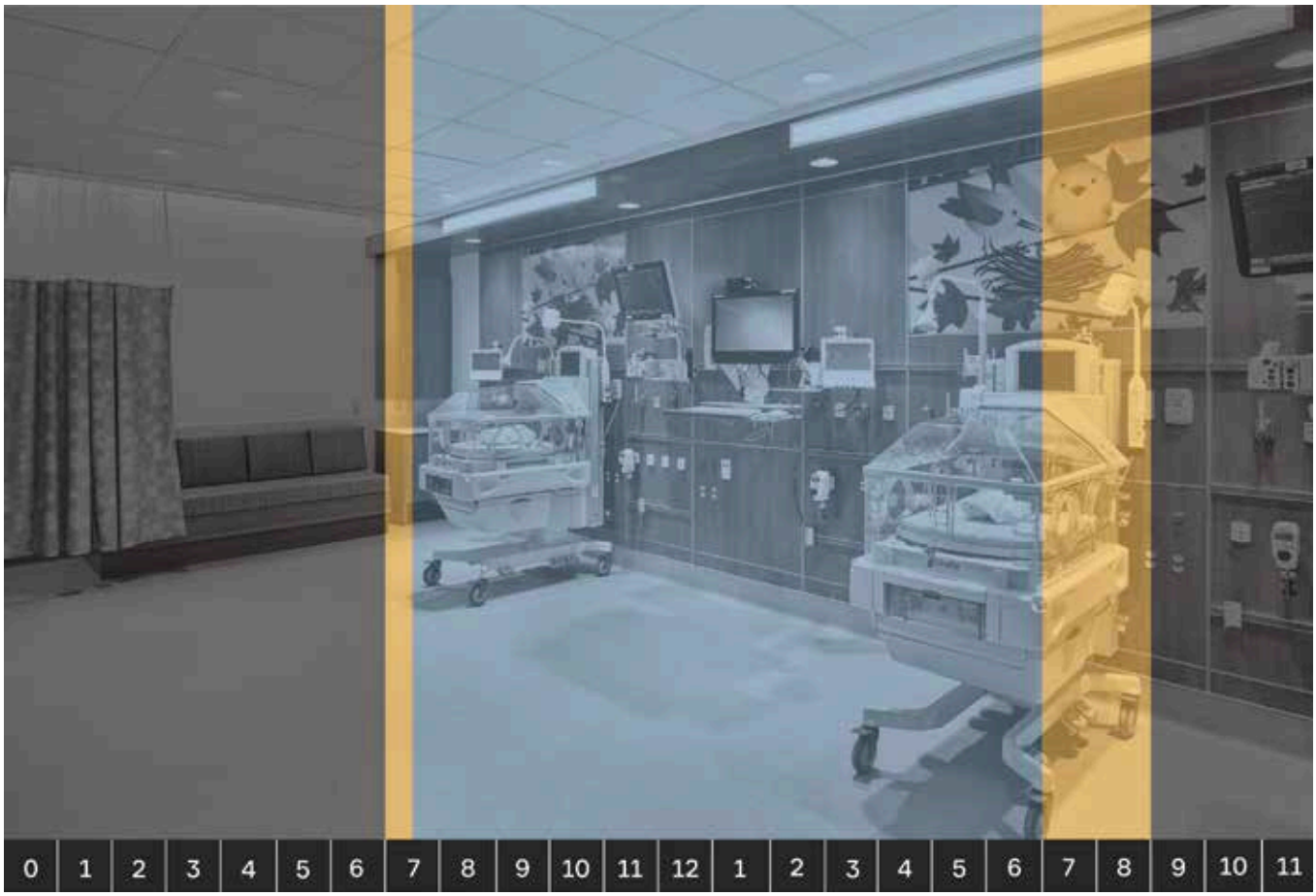
By minimizing the high-light-level overrides, we can reduce sleep disruption. It is understood, however, that overrides for emergency or procedural reasons are required. Upon data review, it was evident that after a system override, the lighting was frequently not returned to its programmed state. As a result, the lighting often remained off through a portion of the morning or remained in exam mode during the day. We understood this may be an issue with the control system installed, but the data made it clear that the system had limitations.

Selection of systems and other elements for products moving forward must be considered. For example, improved button preset labeling could improve staff understanding, or better training could be provided. Or, rather than being dependent on staff for a program reset, an automatic time-out would be more effective, returning the lighting to the pre-programmed color, spectrum or intensity.

Through the design and completion of each project, we as designers are continually adapting to new technologies and project requirements, fostering the evolution of design and product development. The UK NICU project has informed elements during design of the recently constructed Cincinnati Children's Hospital Medical Center (CCHMC) NICU and is continuing to inform our approach to the current design of the Houston Methodist Hospital Centennial Tower.

**Data was collected in 5-minute intervals, from 5 patient rooms, over the course of 25 weeks**

Although the system at Cincinnati Children's is entirely different from the UK NICU and highly customized in response to the research intended, there are elements that the previous design informed. In each patient room, a manual override of the programmed circadian system was initially going to be excluded based on research team requests. Upon sharing our previous practice and experience, design changes were made and a manual override for staff and families was included. The override is only for ON/OFF but it returns automatically to preset programming, ensuring the day/night cycle is repeated each day. This is achievable due to the complexity of the customized control system that tracks the intended color, spectrum and intensity throughout the day,




ensuring that manual overrides do not interrupt the underlying programming. Although this operation appears straightforward, there is significant complexity required. Through advances in technology, this control is becoming more available in standard product, but it is critical to confirm the operability of any proposed control system prior to making a final selection.

Looking ahead to the Houston Methodist Centennial Tower that is currently in final design, previous experiences are informing design decisions in other ways. Although there is no NICU, the raise/lower timing of the manual overrides within the patient room low-voltage control system are being modified to increase response speed. With the intent to minimize sleep disruption, the goal for overrides to respond more quickly reduces the need for nursing staff to turn more lights on in the middle of the night. With the knowledge gained from the UK NICU project, in combination with questioning current product standards, this simple change will improve the patient/staff experience. Elsewhere in the building—to improve staff well-being and satisfaction in select windowless areas where daylight is inaccessible during the day due to the large floor plate—we have proposed a simplified lighting system designed for circadian support. Based on understanding of the highly complex systems in the previous two facilities, this simplified approach reduces the additional cost often associated with these systems. By using a targeted spectrum LED board with a single 0-10-V channel of control, the control system specified for other areas of the building is

Final programming included a warm 3000K early morning setting to begin the day, high light level at 5000K from 7 a.m to 7 p.m. and 3000K again in the evening from 7 p.m. to 9 p.m.

**The data enabled us to compare programmed settings vs. daily manual adjustments**

also able to operate this one. Despite the simplicity intended, it is well understood that conversations are still required to understand staff shift length, provide suitable manual overrides and appropriately educate the staff.

Technological advancements in the lighting industry enable the design of very complex lighting systems. However, as designers, we must continue to ask critical questions during system and product selection processes to ensure efficient and effective system operation. The rare insight from the above examples provides a deep data review, allowing the design team to implement future improvements and inform similar designs—ultimately leading to increased staff satisfaction and better patient outcomes. ◎

Because of automatic resets, manual overrides at this children's hospital in Cincinnati do not interrupt day/night programming.

**THE AUTHOR** | Lauri Tredinnick, Member IES, is the studio leader for Pivotal, the lighting design studio within Affiliated Engineers. She has more than 30 years of experience in designing and managing a broad range of lighting design projects in the public and private realms. This article is based on her presentation at the IES Light and Health Symposium.

2023 THE HOWARD BRANDSTON

# STUDENT LIGHTING DESIGN EDUCATION GRANT

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**The Award** is a grant in the amount of $3,000 USD as well as a plaque. Honorable Mention (if awarded) is a grant in the amount of $1,000 USD and a certificate.

**The purpose** of the Howard Brandston Student Lighting Design Education Grant is to foster good lighting and to advance the appreciation of lighting as an art.

**To be eligible to enter** this competition, applicants must be enrolled as full-time students in an approved academic degree program. Approved programs are those offering a substantial core of illumination studies and are either engineering technology programs accredited by the Accreditation Board for Engineering and Technology; architecture programs accredited by the National Architectural Accrediting Board; interior design programs accredited by the Council for Interior Design Accreditation; or theatre programs accredited by the National Association of Schools of Theatre. If there is a question about accreditation, please query.

**Group entries** are acceptable, However, if a group entry is selected, a single plaque/crystal/certificate with each team member's name will be provided for display at their school.

## Calendar

**Project Open:** September 15, 2022
**Project Deadline:** June 17, 2023
**Project Judging:** Mid-June 2023
**Grant Notification:** July 2023
**Recognition:** At the IES Awards ceremony during the 2023 Annual Conference in Chicago, IL in August 2023.

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Photo: Ed Wonsek

# COMPLETE ALIGNMENT

A new high school in Massachusetts will encompass a holistic approach to 'wellness' that combines building materials and the needs of the community and those who will use it every day

**By Alexandra Gadawski and Jaime McGavin**

While there are many factors that contribute to a well-designed K-12 learning environment, student and teacher well-being is foundational to this work. According to the U.S. Environmental Protection Agency, Americans spend 90% of their time indoors. The most recent data available from the National Center for Education Statistics show that students in the U.S. spend on average 6.66 hours a day and 178.9 days a year in school (National Center for Education Statistics, 2022). With such a significant portion of a child's developmental stages spent inside of school buildings, it is critical that these environments promote health and wellness. An essential component of this is lighting design. The lighting in a space affects mood, behavior and productivity, so to provide every student with thoughtful, well-lit learning spaces, designers must carefully consider how to integrate artificial and natural lighting in a way that supports project goals and occupant well-being.

At the outset of a project, it is critical to set educational and sustainability goals, as well as associated benchmarks to measure progress along the way. This will ensure that all components of the design, from material selection to lighting design, align with the school and community vision. The AIA Materials Pledge (**Figure 1**)—which focuses on human health, climate health, ecosystem health, social health and equity, and the circular economy—provides an accessible framework to guide the goal-setting process. Aligning goals across disciplines amplifies the impact, and while this framework was developed by architects, it is a valuable resource for evaluating lighting design strategies.

For the new Bristol-Plymouth Regional Technical School in Massachusetts, HMFH Architects utilized the AIA framework to guide the visioning process of this 400,000-sq ft career technical high school and help the public-school client consider design and sustainability goals holistically. Using four lenses—environmental, economic, social and educational (**Figure 2**)—the visioning team evaluated project goals and determined the following five driving forces for the design of the new school:

- A building design that strengthens the community's identity, serves as a community resource and is a symbol of Bristol-Plymouth's forward-looking educational model
- A net-zero energy ready design with efficient use of resources, energy, water and materials
- A resilient, durable and future-proof building
- A building that also serves as a teaching tool
- Connection to the site's natural features and environmental systems

Once a concrete set of project goals have been determined, the next step is to identify trackable metrics to document progress throughout the iterative design process. For Bristol-Plymouth, which is targeting to be net-zero energy ready, a critical


Figure 1 . The AIA Materials Pledge.

benchmark to track is lighting power density (LPD). In alignment with the ASHRAE goals for net-zero energy schools, the project is targeting an LPD of 0.45 (AHSRAE et al., 2018), which will help reduce the project's energy use intensity (EUI) and contribute to the goal of net-zero energy. As the lighting design evolves, this benchmark can be used to evaluate the cost and benefit of each decision. As well as considering energy use and operational carbon, we need to consider embodied carbon in our design. The project benchmark for embodied carbon uses London Energy Transformation Initiative data, which suggest a project benchmark of 15% below the baseline building for schools (London Energy Transforamtion Initiative, 2020). The project will aim to reduce the embodied carbon of the building 15% from this benchmark, and lighting design will need to be part of these reductions.

During the next phases of design, it is critical to consider many interrelated design decisions within the context of the established project goals. Big design moves including building orientation and window placement help ensure core learning spaces are daylit during school hours, effectively minimizing the use of artificial light and reducing operational energy use. To determine the best design solutions for these strategies, box models of typical classrooms are used to analyze lighting conditions and ensure spaces are free of glare. Energy modeling through all phases of design allows the team to compare lighting data against the predetermined benchmarks to understand the impact of each design option.


Figure 2 . The team evaluated goals using four lenses.

Material transparency is foundational to making informed specification decisions. On this project the decision was made to prioritize products that are red list free and document this with

Figure 3. Efficient luminaire layouts are one of many factors contributing to the optimization of lighting impacts.

a Declare Label. The International Living Future Institute describes the Declare Label as a "nutrition label" for products (International Living Future Institute, 2022). These labels allow specifiers to understand what chemicals compose the products they are selecting, and to prioritize those that are free of chemicals which are known to cause health impacts on humans and the environment. The design team is focused on finding options with Declare Labels for the classrooms and the corridors, spaces which account for approximately 70% of the school.

An integrated and efficient building design lowers operating and maintenance costs. The American Physical Society has found that if current and emerging cost-effective energy efficiency measures are employed in new buildings and in upgrades of existing heating, cooling, lighting and other operating equipment, the growth in energy demand from the building sector could fall from a projected 30% increase to zero increase between now and 2030 (APS Physics, 2008).

A host of lighting decisions will be integral to this effort (**Figure 3**). Efficient luminaire layouts and lighting levels appropriate to the use of the space, as well as the specification of appropriate reflectance factors for painting and coatings, are all important factors for optimizing lighting impacts. Smart controls can minimize the amount of energy use, but even when a luminaire is off, its embodied carbon and material-health impacts need to be considered. Only the persistent and careful attention of an integrated design team can achieve such ambitious energy reduction goals.

Outside the building of the new Bristol-Plymouth Regional Technical High School (a similar project shown in **Figure 4**), the design team can also take advantage of the surrounding protected wetlands. Outdoor shop classroom

Photo: Ed Wonsek

Figure 4. A recently completed project demonstrates how natural elements can be woven into school design.

**KEY TAKEAWAYS FOR YOUR NEXT PROJECT**

- Integrate sustainability into the visioning process
- Convey goals across the project team
- Determine metrics and assignment reasonability, and formalize timeline and milestones
- Utilize discipline-specific knowledge to support larger project goals

spaces will be integrated into the landscape as a simple way to gain more access to daylight while connecting students and staff to the natural environment and reducing dependance on artificial lighting. Highly visible site features encourage occupants to observe the functional and aesthetic value of the sustainable site design. During the design process, it is important to be conscious of the adverse environmental effects of light pollution, which is the disruptive use of artificial light. Holistically sustainable lighting design involves reducing multiple forms of light pollution including uplight, glare and light trespass. Well-shielded and well-directed light, as well as increased night-sky access, improves nighttime visibility and reduces the negative impacts of light pollution on wildlife habitats (U.S. Green Building Council, 2020).

Moreover, in an educational environment, designing the building as a teaching tool is an effective strategy for promoting environmental stewardship and inspiring curiosity among students. Exposed and highly visible building structures and systems promote passive learning and is an engaging way to incorporate sustainable and practical elements into the design aesthetic of a school. For example, highlighting the inner workings of a building's lighting, power, communications and mechanical systems provides students with a visual representation of a complex system (**Figure 5**). This is particularly relevant to many career technology programs, where data and communications are integral to the curriculum. Educational graphics are a great resource to further this concept and can be used

Figure 5 . Exposed building structures and systems promote passive learning.

to articulate the makeup and function of complex systems with bold and engaging visuals.

It is the design team's responsibility to advocate for high-efficiency mechanical systems, LED lighting and smart controls that will minimize a project's impact. It is also important to provide teacher training manuals explaining classroom controls and operations to ensure that systems are used as intended. Clearly articulating project goals and benchmarks across the entire integrated design team is critical to the success of a project. Early discussions with engineers can offer more flexibility later in the design process. For example, communicating the benefits of increased floor-to-floor height and shaft spaces will allow for future flexibility to reprogram spaces in accordance with new technologies and systems.

As the design of the new Bristol-Plymouth Regional Technical School evolves, we continue to reference initial project goals to ensure the design reflects the vision of the school and community members. While this case study centers on educational design, the lighting design and goal setting framework discussed can be applied to any project type. ◎

**THE AUTHORS** | Alexandra Gadawski, WELL AP, AIA, LEED AP BD+C, is an architect and sustainability leader at HMFH Architects, an educational design firm based in Cambridge, MA. She holds a Master of Science in Environmental Design of Buildings from Cardiff University in Wales and a Master of Architecture from the Rhode Island School of Design.

Jaime McGavin, LEED AP BD+C, is an architectural designer at HMFH Architects. McGavin holds a B.S. in Architecture and a M. Arch. from Roger Williams University.

## References

1. AHSRAE et al. (2018). Advanced Energy Guide for K-12 School Buildings. ASHRAE.
2. APS Physics. (2008). Energy Future Think Efficienctly . American Physical Society.
3. International Living Future Institute. (2022, May 12). The Declare Label.
4. London Energy Transforamtion Initiative. (2020). LETI Climate Emergency Design Guide. London: London Energy Transforamtion Initiative.
5. National Center for Education Statistics. (2022, 03 10). Schools and Staffing Survey.
6. Planet Natural. (2022, May 2). Many Benefits of Sensory Gardens.
7. U.S. Green Building Council. (2020). LEED V4.1 Building Design and Construction. U.S. Green Building Council.
8. United States Environmental Protection Agency. (2022, 03 15). Indoor Air Quality What are the trends in air quality and their effects on human health?

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# WIDE WORLD OF WELLNESS

The defintion of 'light and health' is expanding to include some unusual projects

**By Paul Tarricone**

What do a department store, a fitness center and a firehouse have in common? They each stretch the application of "light and health design techniques" beyond first-generation projects in senior-care facilities, hospitals and classrooms.

Photo: Rohspace

# ROOF RESPITE

After a busy day of shopping at the **Hyundai Department Store Mokdong** in Seoul, consumers are beckoned to the roof where they can rest under the "clouds." These clouds, however, are really clusters of "biophilic fixtures" hovering above both humans and plants.

The design by Casper Mueller Kneer Architects and Lichtvision Design leverages both natural and electric light. Daylight only enters the room through the side windows. The ceiling above is flat and does not let in any daylight. While it's modeled after a greenhouse roof, its panels had to be artificially backlit.

The space is visually broken up by islands of green plants embedded in the floor. A "swarm" of plant-friendly LED lights is placed above each island to promote both human and plant well-being. These pendant fixtures float above the plants like diffuse luminous clouds. To parallel the space's architectural style, Lichtvision specified luminaires with an industrial aesthetic and a raw aluminum finish.

To compensate for the small amount of daylight in the space, LED light is used to enhance the health of the plants in the glasshouse. LED luminaires with a color temperature of 4000K were chosen. LED chips with reduced red-light component were used to avoid overstimulation and to avoid creating a stressful growth environment for the plants. In addition, the illuminance levels were designed to meet the plants' needs while preventing glare to visitors.

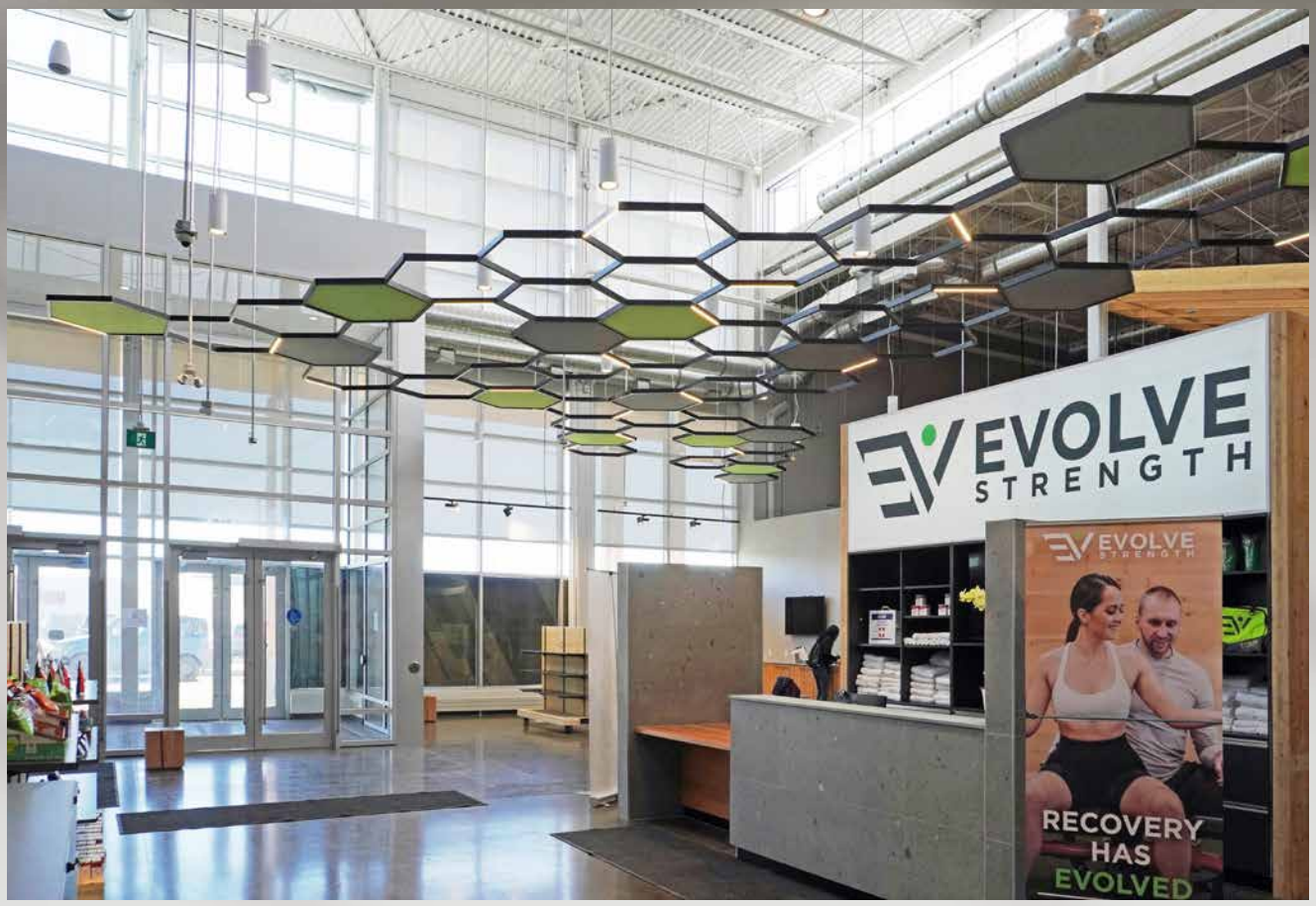


Photo: Bold Interior Design, Inc.

# A FRIENDLY WELCOME

A big-box interior may not be the best environment for a health and wellness center seeking a more intimate experience. But at **Evolve Strength's** new club in Calgary, Alberta, a large luminaire system ironically helped bring the space down to size.

Canadian-based Bold Interior Design, Inc., designed the 30,000-sq ft space. Renovation challenges included a 30-ft ceiling height, massive timber features flanking the central entrance, and the acoustical issues that come with combining a gym and wellness offices for a chiropractor, massage therapist and other health professionals. Renovation began in October 2021 and was completed in February 2022.

When Bold principal Troy Dashney reviewed the original layout, he noted there was no "anchor" for this vast space, prompting him to seek out an architectural element to incorporate into the design. With approximately 30% of the interior dedicated to wellness professional offices, the reception area functions as a "welcome zone" for patients and fitness club members. Dashney knew he needed to anchor the eye when guests enter by lowering the perceived height of the space to make it more intimate without closing it in.

The solution was a hexagon-shaped acoustic lighting system (Axis Lighting) installed over the reception/welcome area, as well as the café and lounge space. The 41-ft by 46-ft system uses 3500K light to create a change in color temperature from the other areas and set apart the welcome area and lounge. The system also incorporates Evolve's corporate colors of green and gray.


Photo: Joiner Architects

# SAFETY IN THE STATION

Firefighters in Harris County, TX, have one less health risk to worry about with the installation of germicidal lighting at their new firehouse. Construction of the $6.8 million **Cypress Creek Fire Station 25** began in December 2020, with the building opening in January of this year. The 16,000-plus sq ft facility includes three bays for fire engines and an ambulance, as well as a gear storage area, day room with stadium seating, dorm rooms and a kitchen/dining area.

During the design phase, the county and Joiner Architects sought out state-of-the-art technologies wherever possible for all building systems. With that, the project team reached out to Kenall Lighting, whose visible light disinfection system (Indigo-Clean) has been used in hospitals and schools. The station's 24/7 cycle put a premium on cleaning protocols.

LED luminaires with 405-nm lighting were installed across the facility for continuous disinfection of the air, and hard and soft surfaces. They include two undercabinet luminaires (2-ft and 4-ft long) and 51 wide-distribution 4300K LED downlights at 22 watts. The technology reduces viruses and bacteria, including SARS-CoV-2, Influenza-A and staph such as MRSA. ◎

# PROJECT IN PICTURES

## New Space for Old Masters

While The Frick Collection in Manhattan undergoes renovation, the institution's Old Masters collection is temporarily housed in the Breuer Building on Madison Avenue. The feel of the 1960s Brutalist-designed location of **Frick Madison** is in direct opposition to the permanent mansion's gilded-age opulence. Set against unadorned gray walls, paintings in gold frames, bronze sculptures and porcelain objects seemingly glow. **Anita Jorgensen Lighting Design** took a three-layered approach to the lighting scheme after creating a mock-up to compare LEDs and modifying existing track lights to enhance lighting distribution.

Photos: Joseph Coscia Jr.

First, **walls** were brushed with 5 to 7 footcandles of soft white light.

The gallery's **irregular window** is equipped with a fritted light-reducing, UV-blocking film, while a single fixture is equipped with a filter to subtly shift from 3000K to a cooler 3400K to blend with natural daylight.

Light-sensitive **Mughal carpets** within the exhibit are limited to 3- to 5-fc illumination.

Then, **paintings** were highlighted at 18 to 27 fc. Finally, the floor was illuminated with 5 fc of ambient light to avoid a donut effect.

A single shadow in the **porcelain installation** provides a sense of visual consistency.

# No More Modifications: Glare Control from a Circadian Perspective

In three years in three different centuries, three important developments in lighting each occurred twice on two different continents. In 1879, the incandescent lamp was patented in the U.S. by Thomas Edison and in England by Joseph Swan. These early lamps used carbon thread, bamboo filaments, and eventually durable tungsten wire to provide glow. Better filament materials meant higher light output and before long, bare incandescent lamps became visually glaring. In response, illuminating engineers began using globes, shades and other diffusers to reduce discomfort glare, which brings us to the second time important developments for lighting simultaneously happened across oceans.

AUTHOR

JOHN D. BULLOUGH

Various treatments to diffuse the light from incandescent lamps had been implemented up until the 1920s. For example, sometimes a coating was sprayed on the bulb's exterior. However, the coating could easily smudge and the bulbs were notoriously difficult to clean. Alternatively, the bulb could be etched or sanded to change the glass from transparent to translucent, but this increased the fragility of the bulb.

In the '20s, junior engineers at General Electric were hazed—superiors would assign them something seemingly impossible, the lighting equivalent of a Scout-prank "snipe hunt:" to figure out how to frost a bulb from within. However, someone forgot to let new-hire Marvin Pipkin in on the joke, and in 1925 he demonstrated an acid wash that softened glare. Coincidentally, Japanese engineer Kyozo Fuwa from Tokyo Shibaura Denki (now Toshiba) also invented an interior-frosted bulb in 1925—the second double-continent discovery.

Glare from incandescent lamps was soon classified based on wattage. Lamps were clear ("harsh"), frosted ("soft") or enclosed by translucent globes ("softer"). Then, when tubular-fluorescent lamps were introduced, their luminances (~8,000 cd/m$^2$) were much lower than a bare-incandescent filament (10+ million cd/m$^2$) or even a frosted lamp (100,000+ cd/m$^2$). However, even fluorescent systems couldn't banish glare altogether, and new glare metrics like visual comfort probability (VCP) or the unified glare rating (UGR) were required.

Similarly, as LEDs have more recently supplanted fluorescent lamps, further *ad hoc* modifications to old glare metrics have been introduced to account for small and non-uniform lighting systems. Yet other systems addressing discomfort glare were developed for roadway and outdoor lighting, or for sports installations (just visit *www.cie.co.at/publications* and search "glare"). It seems that glare is the "Whack-a-Mole" game of lighting. With each new application or technological development, new standards are devised to keep stray photons from hurting our eyes. Which takes us to the year 2001.

On August 15, 2001, two papers were published in different journals,[1,2] on the same topic: the spectral sensitivity for light-induced suppression of nocturnal melatonin synthesis, a response that is used as a marker of the human circadian system. In a third example of intercontinental synchronicity in lighting, the papers were authored by research groups in England and America. Both papers sug-

gested that the human circadian system is maximally sensitive to short visible wavelengths peaking near 460 nm; these results helped the search for the mythical "circadian photoreceptor(s)" which we now know include intrinsically photosensitive retinal ganglion cells (ipRGCs). These and subsequent findings contribute to our understanding that light isn't just for vision—light strongly influences our circadian regulation—meaning, light influences our sleep and overall health. But what, if anything, do the discoveries since 2001 have to do with discomfort glare?

One possibility is that ipRGCs might influence the spectral sensitivity for discomfort glare, which has increased short-wavelength sensitivity (**Figure 1**).[3] Aside from that, however, a growing number of field studies in office, classroom and healthcare environments have led to the realization that our usual techniques for lighting in buildings are not ideal for supporting entrainment of the circadian system. Specifically, consensus is emerging that for daytime-active people, relatively high vertical illuminances reaching building occupants' eyes during the daytime and low illuminances at night can help consolidate circadian rest-activity rhythms.[4,5] But higher vertical light levels could portend increased discomfort glare and reduced occupant satisfaction.

Despite the piecemeal nature of standards and systems to quantify and predict discomfort glare, I argue in a recently published book describing an approach toward an Integrated Glare Metric (IGM)[6] that visual discomfort from a source of light in every application and at every light level is fundamentally impacted by the following four factors: the amount of light the source produces at the observer's eyes; the contrast between the source and its background; the spectral distribution (color) of the source; and the maximum luminance of the source. I believe the last factor is part of the reason so many glare standards have come about.

In applications such as offices, streets, sports fields or factories, different fixture types might be used—sometimes large, diffuse fixtures and other times small, intense fixtures. In many outdoor situations the fixture appears as a small point source, whereas in an interior office space the fixture is large and might contain segments with different luminances. If a fixture subtends less than 0.3 deg of visual angle (equal to a solid angle of 27 microsteradians), the maximum luminance

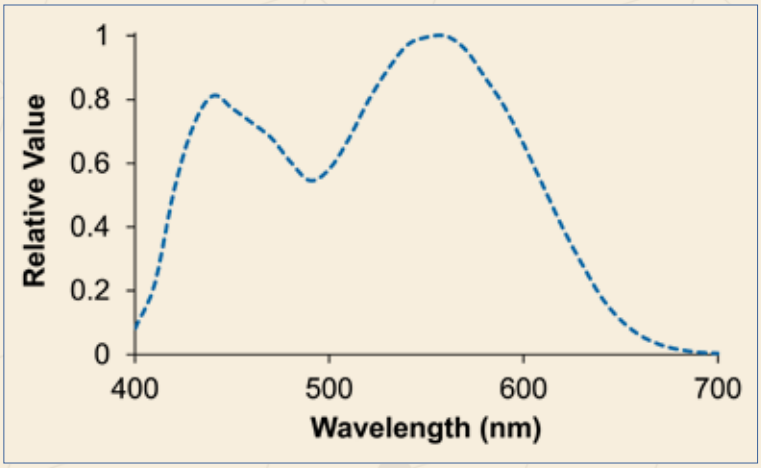


Figure 1. Spectral sensitivity function for discomfort glare.

doesn't influence discomfort glare, but if the fixture is larger, it most certainly will influence discomfort glare.[6]

The IGM framework describes how the aforementioned factors influence glare under a wide range of lighting conditions. The framework is based on a model developed initially for outdoor lighting, but which has also been shown to predict glare responses well under indoor lighting conditions.[6] In an indoor office space like that shown in **Figure 2**, the factors can be defined in the following manner:

- The illuminance ($E_L$) at the eyes from the luminaire (shown in yellow in Figure 2) depends upon its luminous intensity in the direction of the occupant. Higher illuminances tend to increase discomfort.
- The luminance ($L_L$) of the brightest 0.3-deg wide portion of the luminaire often depends upon the size of the luminaire. (Tiny LED fixtures can be quite bright.)
- Both $E_L$ and $L_L$ should be weighted by the spectral sensitivity function in Figure 1.
- The illuminance ($E_S$) from the luminaire's immediate surround comes from the ceiling (shown in green). Higher illuminances reduce glare because they reduce the luminaire's visual contrast.
- The ambient illuminance ($E_A$) comes from the walls (shown in blue). Like the surround illuminance, higher-ambient illuminances reduce glare.

**Glare is the 'Whack-a-Mole' game of lighting. With each new application or technological development, new standards are devised**

Based on the illuminance quantities, the discomfort glare potential (DG) for a lighting installation can be operationally defined as:[6] $DG = \log(E_L + E_S) + 0.6 \log(E_L/E_S) - 0.5 \log(E_A)$.

In turn, these quantities can be converted to a rating scale that describes the subjective sensation the occupants will experience. The IGM scale (**Figure 3**) reverses the familiar nine-point scale used by pioneering glare researcher J.B. De Boer in his many investigations, and is predicted by: $IGM = 3.4 + 6.4 \log(DG) - 1.4 \log(50{,}000/L_L)$.

Let's assume that the room in Figure 2 is a 20-by-20-ft office with a 9-ft ceiling height, with a ceiling reflectance of 0.8

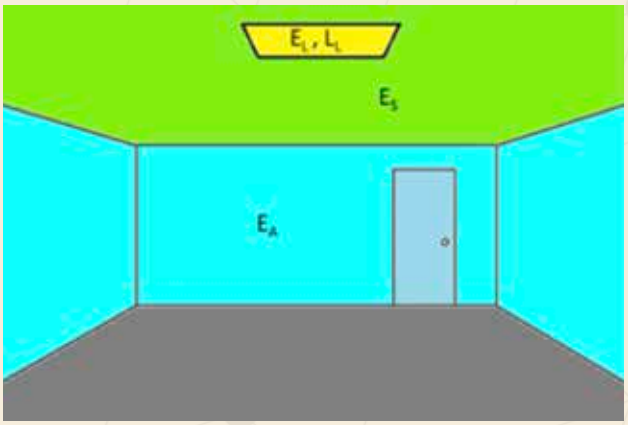


Figure 2. Schematic room view for discomfort glare analysis.


Figure 3. IGM rating scale.

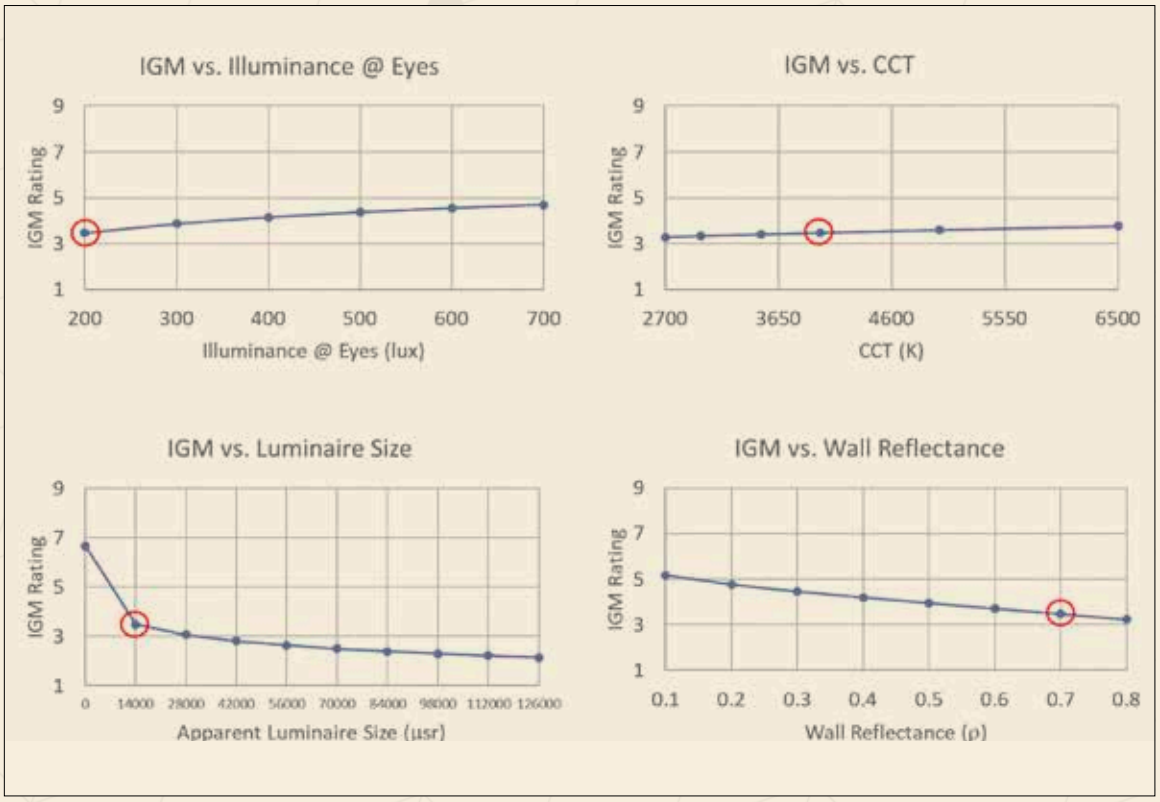


Figure 4. Influence of illuminance at the eyes, luminaire size, CCT and wall reflectance on discomfort glare. The circles indicate the reference condition described in the text.

and a floor reflectance of 0.2. Suppose the wall reflectance could range from 0.1 (black) to 0.8 (white). Suppose also that the luminaire(s) in the space specified to produce a horizontal illuminance of 300 lux could also, for the purpose of providing circadian-effective light, produce a vertical illuminance more than the 100 to 150 lux expected from conventional lighting, and instead produce between 200 and 700 lux at the occupant's eyes, with a CCT ranging from 2700K (warm white) to 6500K (cool white). Finally, suppose the luminaire(s) have an angular size ranging between 76 microsteradians (the size of an MR16 lamp, with a luminance greater than 1 million cd/m$^2$) and 126,000 microsteradians (a large 6-by-6-ft luminaire, with a luminance lower than 1,000 cd/m$^2$).

Now let's define a reference condition as a vertical illuminance 200 lux at the occupant's eyes, from a 2-by-2-ft, 4000K troffer luminaire, and with a wall reflectance of 0.7. This condition is indicated by the circles in **Figure 4**, and the expected rating (based on the equations above) is just above 3, corresponding to a "satisfactory" amount of glare. How would discomfort glare on the IGM scale vary for different illuminances, wall reflectance, luminaire sizes and CCT values? The panels in Figure 4 also show how changing each of these parameters affect an occupant's discomfort-glare rating. Both higher illuminances and lower wall reflectance would increase glare, up to a rating of about 5, corresponding to "just acceptable." Changing the CCT would have relatively little influence on discomfort glare—if the source of illumination is nominally white, as would be expected in an office, the role of spectrum on discomfort glare is secondary.

The panel of Figure 4 that illustrates the largest influence on discomfort glare is the one for different fixture sizes, par-

Figure 5. Left: LED ceiling luminaire with high maximum luminance. Right: Northern sky with lower maximum luminance.

ticularly for luminaires smaller than a 2-by-2-ft troffer. In fact, the smallest luminaire size, with the highest luminance, elicits an IGM rating of nearly 7, which corresponds to a "disturbing" amount of glare. This is an important consideration in the era of interior lighting systems like the LED luminaire in **Figure 5**. Even though the illuminance at the eyes from such a system is on the order of hundreds of lux, its glare is more disturbing than, say, a northern view of the sky (which can produce tens of thousands of lux at the eyes). That is because the sky is large and diffuse, and has a much lower maximum luminance than the LED fixture in Figure 5.

It is true that the insights to be gained from viewing curves like those in Figure 4 are not necessarily unique to using the IGM framework. But a truly integrated glare system that does not require new extensions or modifications for small or non-uniform luminaires, or that does not differ for indoor versus outdoor environments would be an important step forward at specifying lighting to help entrain the circadian system during both daytime and nighttime. Researchers and practitioners in illuminating engineering can, and should, use concepts like IGM to develop and test hypotheses that will lead to glare-free lighting installations that support healthy circadian functioning. Who knows? Perhaps one year in the very near future, glare-free circadian-effective lighting will be simultaneously introduced on another two continents (or all seven, if we're lucky)! ◎

**THE AUTHOR** | John D. Bullough, Ph.D., Fellow IES, is program director of Population Health Science and Policy at the Light and Health Research Center, Icahn School of Medicine at Mount Sinai.

**References**

1. Thapan K et al. 2001. An action spectrum for melatonin suppression: Evidence for a novel non-rod, non-cone photoreceptor system in humans. J. Physiol. 535(1): 261.
2. Brainard GC et al. 2001. Action spectrum for melatonin regulation in humans: Evidence for a novel circadian photoreceptor. J. Neurosci. 21(16): 6405.
3. Bullough JD. 2009. Spectral sensitivity for extrafoveal discomfort glare. J. Mod. Optics 56(13): 1518.
4. Underwriters Laboratories. 2019. Design Guideline for Promoting Circadian Entrainment with Light for Day-Active People, DG 24480. Northbrook, IL: Underwriters Laboratories.
5. Brown TM et al. 2022. Recommendations for daytime, evening, and nighttime indoor light exposure to best support physiology, sleep, and wakefulness in healthy adults. PLoS Biol. 20(3): e3001571.
6. Bullough JD. 2022. Understanding Glare in Exterior Lighting, Display, and Related Applications. Bellingham, WA: SPIE Press.

**LightArt** *100% Nearshore Plastic* Coil Seagrass

2022 IES ANNUAL CONFERENCE

## IES Annual Conference Returns with New Orleans Edition

Lighting professionals made their way to the Hilton New Orleans Riverside hotel for the 2022 IES Annual Conference in August. Spanning three days and featuring more than 40 education and paper sessions with more than 60 speakers, the event focused both on leadership in and by the lighting community.

Other highlights from the festive weekend, captured in the photo collage that follows here, included two keynote addresses, the Illumination Awards Gala, the IES Progress Report, the IES Leadership Forum and networking opportunities like a NOLA scavenger hunt.

### 3 DAYS IN 20 PHOTOS


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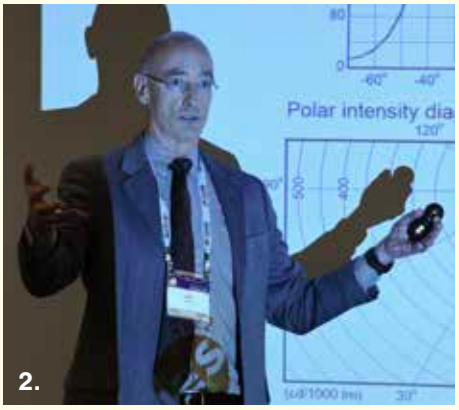

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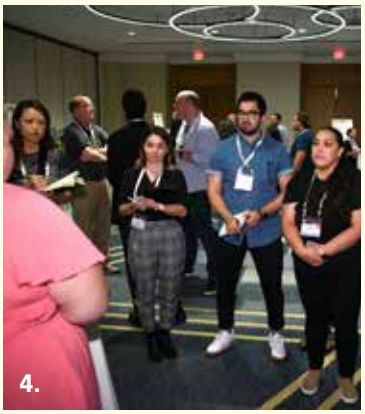
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Photos: Dan White, Fogarty Services

**1.** Attendees viewed the latest products from lighting manufacturers at the Tabletop Exhibits.

**2**. Breakout sessions covered a range of topics from glare perception to germicidal ultraviolet irradiation.

**3.** IES past presidents from as far back as 2002 gathered together for a photo-op.

**4.** The Emerging Professional (EP) Workshop offered early-career professionals the opportunity to learn more about the lighting industry from seasoned professionals.

**5.** EPs engaged with long-standing members of the IES community for deeper insight into the design, science, art and business of lighting.


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**6.** Past president and long-time mentor Mark Roush presents at the EP workshop.

**7.** Guests had the opportunity to network over refreshments during the IES Leadership Forum.

**8.** Speakers at the Leadership Forum focused on topics such as communication, time management, team building, project management and more.

**9.** Lighting community leaders from District 5 in deep discussion.

**10.** IES Executive Director Colleen Harper at the Regional Membership Council.

**11.** Keynote speaker, Adam Rogers, discussed how lighting influenced the famous dress that sparked online debate.

**12.** IES Medal Award recipient, Dr. George "Bud" Brainard, and Louis B. Marks Award recipient, Kim Mercier, earned standing ovations after their remarks.

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**13.** Good friends enjoyed time to catch up and relax at the Illumination Awards (IA) after-party.

**14.** Attendees listened to a lunchtime closing session conversation.

**15.** The red carpet was rolled out for IES Members and award winners on their way to the Illumination Awards Gala.

**16.** Designers of the Ichijo-Toma Co-op Olympia project celebrated in the IA Lounge.

**17.** Fun props spiced up the IA after-party photobooth.

**18.** Design teams from this year's 11 Illumination Award finalists were recognized on stage

**19.** Party-goers enjoyed music and dancing at the dessert reception.

**20.** The Mardi Gras theme enabled endless costume changes at the after-party.

## Society Awards Span Service to Students

Recipients of the 2022 IES Presidential Award and Howard Brandston Student Lighting Design Education Grant were announced at the IES Annual Conference. The Presidential Award is presented to individuals at the discretion of the current President in recognition of exemplary impacts and herculean efforts of volunteerism that occurred during the President's term. This year's recipients are:


Cheryl English


Antonio Garza


Rita Harrold


Kathie Leslie

The Howard Brandston Grant recognizes students, who have demonstrated exceptional professional promise through the presentation of an original solution to a supplied design problem, with an award of $1,000 and complimentary registration to the conference. This year's recipients are:


Tina Wang


Jiacheng Zhu

*For more coverage of Member Awards, see LD+A August.*

## MEMBER MENTIONS

**Peter Timotheatos** has been appointed president of **Lumenpulse**.

**Acclaim Lighting** has named Dan Erdmann as eastern regional sales manager.

**Current** has named Jason Scott Fokens as vice president of general counsel.

Bold = Individual or Sustaining Member

# NEW MEMBERS

The IES is pleased to welcome **61** first-time individual members.

Laura Avila Furque *Columbia*
Kolleen Bailey *TX*
Zahi Barajas *IL*
Derek Barnwell *NC*
David Brownell *TN*
Joseph B. Canada *NC*
Rosa Capo
John P. Caruso *IL*
Alaina Chester
Nam Cho
Chilli Chongo *NE*
Rochelle Daniels *AB*
Tara Dietz *NY*
Angela Dixon *FL*
Cody Dobbelsteyn *NB*
Stonefield Engineering *NJ*
Fabio Feria *Columbia*
Marcia Fournier *CA*
Leslie Friedman *PA*
Jhaan Carlos Garzon Robles *Colombia*
Tae Gold *CA*
Alex Granica *VA*
Dan Griego *CA*
Chris Hartley
Tom Heelan *MA*
Ellen Helm *IL*
Nadav Hirsh *WA*
Mara Honarbin *BC*
Elspeth Johnson *CA*
Wayne King *WA*
Roger Lane *NC*
Joseph Lane *NC*
Han Le *OR*
Chris Lehnen *OR*
Stephen Lewis *UT*
James Lowry *CO*
Shant Madjarian *NY*
Mark McClear
Anthony McVea
Adriel Mercado *FL*
Kevin Mikleonis *CA*
Tal Nissenbaum *Israel*
Madilynn Quinn
Fred Roman *IL*
David Schmitt
Nastaran Shishegar *AZ*
Dyoni Smith *ON*
Gregory C. Speer *TX*
Stacy Stanke *WI*
Josh Sytsma *IA*
Christopher Tress
David Vitrano *LA*
Isak Wall *ON*
Donny Wall *IL*
Doug White *CO*
Lauren Wilkerson *FL*
Leslie Wilson *OK*
Jared Wood *VA*
Aaron M. Wood *MI*
Afton Wright
Conrad Wysor

*As of July 31, 2022

# UNIVERSITY MEMBERS

British Columbia Institute of Technology
IUPUI (Indiana University-Purdue University Indianapolis)
Kansas State University
KTH Royal Institute of Technology
Lawrence Technological University
Milwaukee School of Engineering
New York School of Interior Design
Oregon State University
Parsons/The New School
Penn State University
Texas A&M University
University of Colorado, Boulder
University of Massachusetts Dartmouth
University of Nebraska
Virginia Tech

## Join an IES Technical Committee

The **IES** is comprised of more than 75 technical committees and subcommittees that develop consensus-based standards for the lighting industry. Technical committee members are comprised of industry professionals who volunteer for a few hours each month shaping **IES** lighting standards.

To be considered for a committee assignment, please complete a submission form at **www.ies.org/ies-committees/join-a-committee/**

# IES SUSTAINING MEMBERS

The following companies have elected to support the Society as Sustaining Members which allows the IES to fund programs that benefit all segments of the membership and pursue new endeavors, including education projects, lighting research and recommended practices.*

## CHAMPION

AcuityBrands.
COOPER Lighting Solutions
signify

## AMBASSADOR

Current

## BENEFACTOR

HLB Lighting Design
Hubbell Lighting
LUMA Lighting Design/ PAE Engineers
Lutron Electronics Co
Musco Lighting
P2S Inc.
Q-Tran
Rosendin Electric, Inc.

## SUPPORTER

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Albert Chong Associates
ANP Lighting
Axis Lighting
BK Lighting
Boca Flasher
BR+A Consulting Engineers
Cannon Design
Capital Electric – A Sonepar Company
ConTech Lighting
CRB Group
Cree Lighting
DLR Group
Duke Energy Co.
Edison Opto Corporation
Energy Focus Inc.
ETC, Inc.
Evluma
Focal Point, LLC
GE Lighting, a Savant Company
H.E. Williams Inc
Hapco
Heper USA LLC
iGuzzini Lighting USA
Integrated Design Solutions
Kenall Mfg. Co.
Legrand
Leotek Electronics LLC
Lighting Services Inc.
Los Angeles Lighting Mfg. Co.
LSI Industries, Inc.
Ministère des Transports du Quebec
Nanometer Lighting
OCL Architectural Lighting
Pacific Northwest National Laboratory
RAB Lighting, Inc.
Radiant Vision Systems
RDG Planning & Design
Spectrum Lighting Inc.
Sternberg Lighting
Targetti USA, Inc.
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Tresco Lighting
USAI Lighting
Visa Lighting
Vode Lighting, LLC
VOLT Lighting
Zumtobel Lighting

*Contributor Sustaining Members are listed at *www.ies.org*.

## THE IES WELCOMES THESE NEW SUSTAINING AND UNIVERSITY MEMBERS

- Mantecon Partners Inc.
- Barge Design Solutions
- HP Engineering
- John Burns Construction
- Amerlux Lighting
- Fonroche Lighting America
- Fusion Optix

Whether you are a manufacturer, utility company, distributor, sales agency, engineering firm, architectural firm, or any other professional or technical business that engages with lighting, each organization can pick and choose levels of benefits and discounts for their company employees directly—and in certain cases, non-employees' partners, as well—furthering the reach to a larger group of professionals. The complete new Sustaining Membership structure (including the tax deduction levels) is listed at: **www.ies.org/membership/ies-sustaining-membership**.

Education institutions that have dedicated lighting programs as well as those higher learning institutions that focus on "lighting" in their curriculums qualify for the University Membership. For more information on program benefits go to: **www.ies.org/membership/ies-university-membership**.

# PRODUCTS

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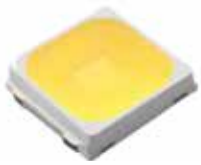

**1. LightArt** introduces Static Links, a configurable acoustic lighting system for indoor spaces. Four geometric shapes—X, Y, T and L—can be connected to make over 100 installations, including clusters, arrows and wave patterns for tiered ceilings, as well as shapes that function in corners. Links range from 3- to 8-ft long and 6- to 16-in. high, and are available a multitude of Sola Felt colorways. End caps are available in wood, or white or black powder-coated finishes.
*www.lightart.com*

**2. ConTech Lighting** by Leviton announces the Gallery XL Track Luminaire for museum, retail and architectural applications. Allowing 0 to 100 deg of vertical rotation and 360 deg of horizontal rotation, Gallery XL features a flat-back cylinder form and integral driver for a simplistic aesthetic that blends into its surroundings and delivers outputs up to 4,600 lumens. Offering five beam distributions, field-changeable optic solutions, and an integrated-ring accessory allowing for up to two shielding media.
*www.contechlighting.com*

**3. 2nd Ave Lighting** announces the Castellon Cascading Pendant for lobbies, entryways and other applications. With seven silver-mica cylindrical diffusers set at various field-adjustable heights, this decorative statement is UL and cUL listed for dry and damp locations. Dimmable and energy efficient options are available, as are custom sizes, styles and colors.
*www.2ndave.com*

**4. Luminus Devices, Inc**. introduces MP-3030-110F flip-chip LEDs, for maximum efficacy in horticultural, outdoor and harsh lighting environments. Without a wire bond and with enhanced sulfur resistance, these rugged LEDs offer a range of CCTs from 2200K to 6500K and CRI options including 80, 90 and 95.
*www.luminus.com*

5.

6.

**5. Targetti** announces an addition to the DART Range: DART ROUND, a floodlight projector allowing for integration intro architectural elements. Available in Small Remote, Small Integral (pictured), Medium and Maxi, and offering a range of CCTs from 2700K to 5000K, this versatile solution provides illumination for large areas as well as precise accent lighting.
*www.targettiusa.com*

**6. LEDTronics** announces the DB605SM Series Low-Voltage Intermediate Double Contact Bayonet Base (Ba15d) LED Bulbs for enclosed fixtures and tight spaces such as panel-mount pilot lights, accent lighting, and as indicator lights in industrial and automotive applications. With the ability to operate in temperatures as low as -22 deg and as high as 122 deg Fahrenheit, and up to 160 deg spherical rotation, the bulbs are ideal for locations subject to frequent vibration.
*www.ledtronics.com*

## SPOTLIGHT Resident

**Resident** introduces the Ghost Lights, available as floor lamps (pictured top) and pendants (bottom). These minimal forms appear as if apparitions: two borosilicate glass tubes house invisible LED sources that delicately illuminate the edges of the glass and provide 600 lumens. Made the same way as test tubes, the glass is highly transparent, scratch resistant and offers high optical quality.
*www.resident.co.nz*

# PRODUCTS

**7. Lightcraft Outdoor** introduces two models of 12-V miniature core lights for steps, decks, walls and ceilings. The SD-610B and the SD-612B offer multiple wattage and CCT options, shock- and heat-resistant lenses, and include field-cuttable PVC pour sleeves. The former is available in stainless steel and natural bronze finishes, while the latter is available in natural bronze.
*www.lightcraftoutdoor.com*

**7.**

**8. Kenall** announces MedMaster BHH, a behavioral health headwall LED luminaire for patient rooms in mental health environments with a contemporary aesthetic. The BHH offers multiple functions such as ambient, exam and reading lights; up and downlight capabilities; an anti-microbial finish; and a diffused, impact-resistant polycarbonate lens. Fixtures are available in 24-, 36- and 48-in. options and come with a limited five-year warranty.
*www.kenall.com*

**8.**

**9. McGraw-Edison**, a Cooper Lighting Solutions brand, announces GALN Galleon II LED area and site luminaire with 16 optical distributions and lumen packages ranging from 3,300 to 73,500 lumens. Along with fixed and adjustable options, fixture options include round and square poles as well as choices of slipfitter, wall, mast arm and architectural upsweep arms.
*www.cooperlighting.com*

**9.**

**10. Lodes**, along with international lifestyle company Diesel, announces ROD, a series of rechargeable and portable table lamps with eight hours of battery life for indoor and

**10.**

**11.**

outdoor hospitality and residential applications. Inspired by construction rods, which typically connect two blocks of cement, these luminaires offer a playful take on a functional form and easy light adjustment: end users need only tap the shade to change the fixture's brightness. Available in soft pink, dark asphalt, ivory and moss gray.
*www.lodes.com*

**11. Luminii** introduces Kurba, a series of bendable LED strips for coves, niches, soffits, millwork and more. Providing dynamic highlights and smooth illumination, this solution is IP67 and/or UL676 rated for built and natural environments. Available in vertical (top) and horizontal (side) bends, infinite lengths, and five sizes and shapes.
*www.luminii.com*

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LIGHT+JUSTICE SYMPOSIUM

# SAVE THE DATE

# LIGHT+JUSTICE SYMPOSIUM

A symposium exploring the intersection of lighting and environmental justice

## NOVEMBER 4, 2022

Details coming soon visit **ies.org/deir**

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## ADVERTISING OFFICES

### GENERAL OFFICES
LD+A Advertising Department

**Leslie Prestia**
120 Wall Street, 17th Floor
New York, NY 10005
212.248.5000 Main
646.834.1452 Direct
lprestia@ies.org

### NORTHEAST/ MID-ATLANTIC

**Holly Dietz**
SAGE Publications
2455 Teller Road
Thousand Oaks, CA 91320
C 805.490.9891
holly.dietz@sagepub.com

States serviced: CT, DE, MA, MD, ME, NC, NH, NJ, NY, PA,RI, VA, VT, Wash DC

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SAGE Publications
2455 Teller Road
Thousand Oaks, CA 91320
C 805.618.4557
sajeevi.henry@sagepub.com

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**Bill Middleton**
Middleton Media
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Visitors enter the Santa Maria Goretti Church in Mormanno, Italy, through a small vestibule framed by a crucifix—a tall incision made in one of its four white concrete apses and illuminated by LEDs (Zumtobel). Designed by Mario Cucinella Architects, the church and its cut wall peacefully guide worshippers inside the modern parish, while transforming the exterior into a nighttime beacon visible from afar.

Photo: Duccio Malagamba Fotografía de Arquitectura

# LAST LOOK

## Baroque Goes Modern

# VEIL
# By PureEdge Lighting

***Infuse Ambient Light From Within the Architecture of the Room***

Shown : PURESMART VEIL IN TRUCOLOR ™ RGBTW (2000K)

Veil Ceiling and Wall feature a slim, plaster-in aluminum channel with a 3” opening and paintable aluminum backer plate. Veil perfectly emanates ambient illumination, creating truly unique architectural lighting. The 24VDC linear LED system mounts directly to studs without joist modification, or between studs, and plasters into 5/8” drywall. Veil is featured in our PureSmart RGBTW (2000K-6500K) lighting collection giving designers over 16+ million colors to choose from. PureSmart lighting offers easy to use, intuitive controls with use of the WiZ Pro software suite including the WiZ Pro setup app, the WiZ Pro dashboard, and WiZ app giving designers access to a full palette of color tuning options. WiZ Pro is a global brand of Signify.

Room Controller

PURE SMART™
by PureEdge Lighting

connected by WiZ PRO

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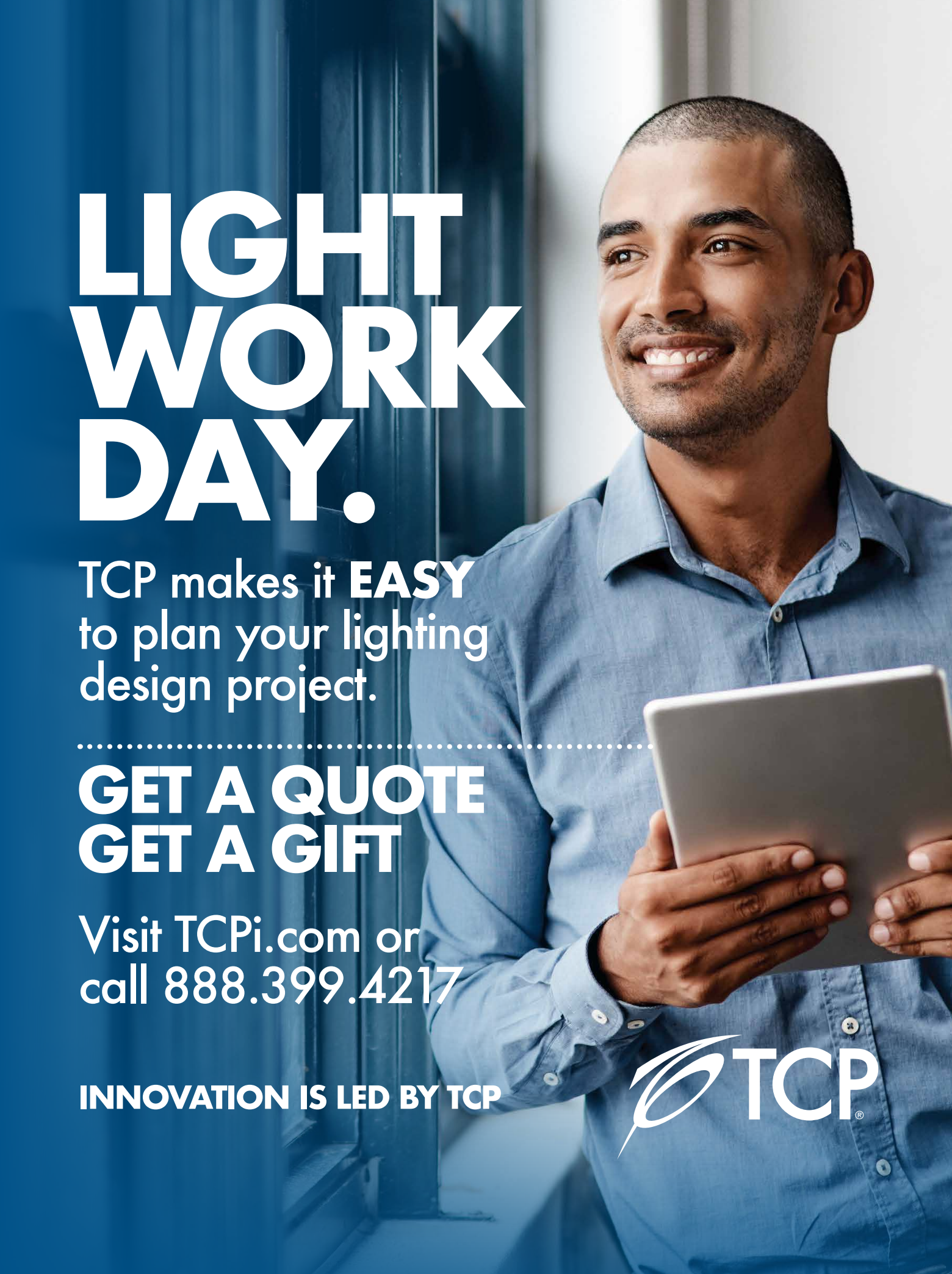
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